The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Steel in Construction.*

BY ALBERT F. HILL, C. E.

Within the last few years there has been developed in this country a tendency toward steel construction, which to-day is so pronounced as to command the most thoughtful consideration, alike of constructors and manufacturers. The adaptability of steel to purposes of construction is probably no longer questioned, for even the most conservative would find it hard to resist the logic of accomplished facts, as pointed out by numerous successful steel structures, both in this country and abroad. Yet there is still a certain distrust of the material lingering in the minds of many thoughtful men, who believe steel to be endowed, more than other material, with that exasperating quality which might be fitly called "the innate cussedness of inanimate objects." This arises undoubtedly from some of the remarkable and seemingly inexplicable failures which have occurred in finished parts of steel, some of them breaking under loads utterly inadequate to produce rupture, others breaking, in some instances, without any apparent cause at all. I use the expression "seemingly inexplicable" advisedly, for I believe that every such extraordinary failure is susceptible of a rational explanation, and can almost invariably be traced, not to any inherent defect in the material itself, but to wrong treatment of the steel during the process of manufacture into the finished part or article. Of course the constructor cannot afford to lose sight of the conditions imposed upon him by the mechanical properties of the material he desires to use, and therefore, in order to harmonize his demands with the possibilities of the manufacturer, there is requisite on his part a thorough knowledge, not only of the mere ultimate strength of the material, but also of the best methods for its treatment in the various stages of manufacture.

In the present state of our knowledge and with the late improvements in the manufacture of "open hearth" steel, the two great essentials—variety of grade and certainty of product—are at the command of the steel maker, and therewith all the necessary elements to successfully meet the requirements of the engineer.

The great advantage which the substitution of steel for iron in construction offers, lies in the opportunity which its greater strength and safety afford to reduce dead load. But to carry this reduction of dead load to its full extent, it is necessary not only to take into consideration the strength of the material, but also to adapt the grade of the steel to the work for which the different parts are designed, and to proportion accordingly, due regard of course being paid to the treatment the members must undergo in the course of their manufacture. That is, members which have to undergo a great deal of local heating ought to be of lower grade than those which, after coming from the rolls, can be finished cold, &c.

In this possibility of adaptation of grade to the work required of the finished part, is to be found not only the beauty and great advantage of steel construction, but perhaps also one of the chief obstacles to its more general introduction thus far; for different grades of steel possess not only different degrees of strength, but are also radically different in their other mechanical qualities, and require different methods of treatment in the working; and hence a successful adaptation of grade necessitates a more extended knowledge of the nature of the material than is requisite in iron construction.

Carbon being the element to which, in a greater degree than to any other, the modification of the mechanical properties of steel is due, the most comprehensive, and at the same time the most convenient designation for the different grades of steel is in accordance with the carbon analysis. It therefore becomes at once evident that all records of tests and experiments in steel, to have any practical value and to be of general service to the profession, ought to be accompanied, if not by a full analysis, at least by a statement of the carbon percentage of the steel under investigation. Another difficulty in the way of obtaining generally available information, is to be found in the fact that so many and so important experimental inquiries are conducted with prepared specimens, and those even of very small size.

Results on the influence of temperature upon steel obtained by heating knitting needles in naphtha, while undoubtedly very interesting to scientists, will not carry conviction to the minds of men who have to handle material in large masses. Test results from millimeter specimens prepared in lathe and planer, cannot and ought not to be taken as a true criterion of the mechanical value of a constructive material.

I propose to lay before you this evening the results of some steel tests, made under such conditions as would naturally arise were the material to be used in a structure. These tests were made partly at the Keystone Bridge Co.'s works at Pittsburgh, partly at the works of Messrs. J. M. & J. B. Cornell, New York City, and partly at the U. S. Arsenal at Watertown, Mass. The steel which has been used in these tests was open-hearth steel, made by Messrs. Anderson & Co., of Pittsburgh, and was taken from different runs. The grades range from 0.30 to 0.50 per cent. carbon, and the steel was made into eye-bars, plates and riveted plate girders. Tests were also made on the comparative value of drilled, reamed and punched holes, as well as upon the mechanical effects of punching, shearing and annealing.

I ought to state here that, while all the eye-bars made of 0.30 per cent. carbon steel were taken from the same run, the 0.30 per cent. carbon plates were taken from another; the same was the case with the 0.50 per cent. carbon eye-bars and the 0.50 per cent. carbon plates, &c.

In order to bring as large a field of investigation as we propose to cover this evening within the scope of a fugitive paper, it is necessary, of course, to be as brief as possible. I will therefore simply state the *modus operandi* of the investigation, with its results, and then, in the discussion of these results, bring out the conclusions to which they seem to lead.

The first series of tests I beg to call your attention to are tensile tests on eye-bars. Eighteen eye-bars were made and divided into two groups, according to the carbon percentage of the steel, viz.: Nine were of 0.30 per cent. carbon open-hearth steel, and nine were of 0.50 per cent. carbon open-hearth steel. Each of these two groups of nine bars was subdivided again into three groups of three each, according to the method of their manufacture, viz.:

1. Three of the 0.30 per cent. carbon and three of the 0.50 per cent. carbon eye-bars were made by the Kloman patent process of rolling eye-bars, and designated "rolled bars."

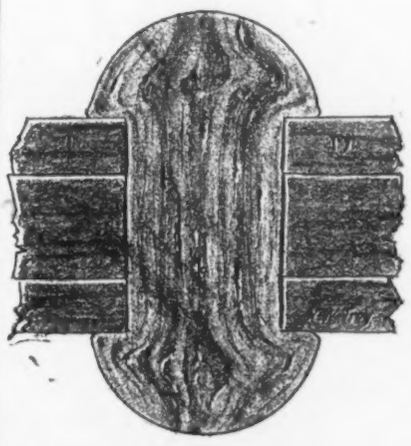
2. Three bars from each of the two groups were rolled to the required section of the stem, with sufficient surplus of length to form the heads by hydraulic upsetting, and designated "upset bars."

3. In the last two groups of three from the 0.30 per cent. and 0.50 per cent. carbon steel respectively, the heads were formed by welding pieces and die-forging, and are designated "welded bars."

The bars, from steel of equal carbon percentage, had all equal sections of stem, and equal head dimensions and pinholes. All the bars were annealed before drilling.

As it was important not only to ascertain the relative strength of 0.30 and 0.50 per cent. carbon steel bars, but also to make comparisons as to the effects of the different methods of manufacture upon the strength of the finished bar, there were taken, previous to their being worked into eye-bars, from each group of nine bars, five, from the ends of which test pieces 30 inches long were cut and broken in the testing machine.

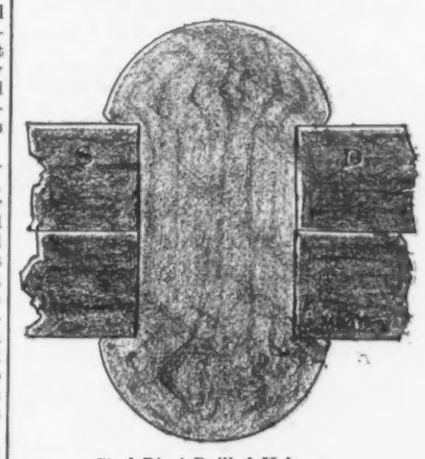
The results obtained from these test pieces are grouped in Table I. (See page 9.)



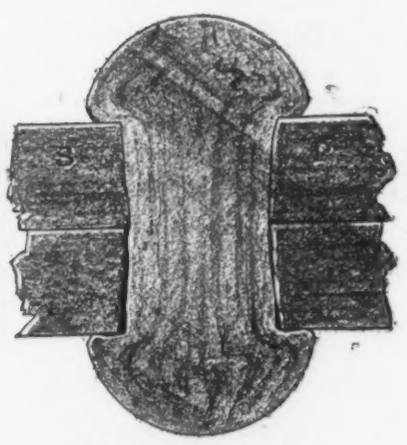
Iron-Rivet Drilled Hole.

Iron-Rivet Punched Hole.

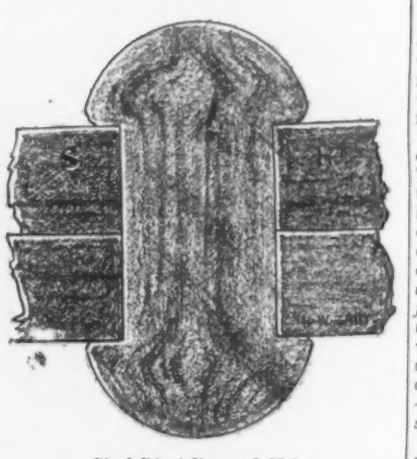
Iron-Rivet Reamed Hole.



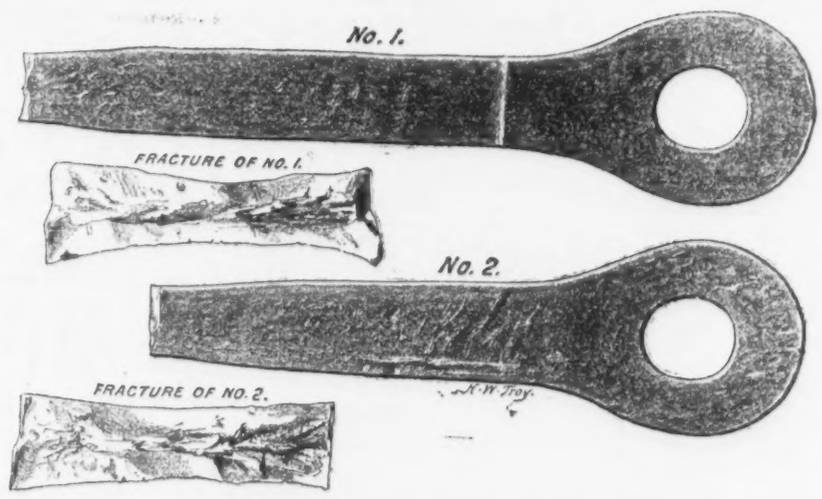
Steel-Rivet Drilled Hole.



Steel-Rivet Punched Hole.



Steel-Rivet Reamed Hole.



No. 1.—Rolled Steel Eye-Bar.—No. 2.—Upset Steel Eye-Bar.

IRON AND STEEL AS A MATERIAL FOR RIVETED STRUCTURES AND EYE-BARS.

Keeping these results in mind, and comparing them with those obtained from the eye-bar tests, as given in Table No. II, we are led to the following conclusions, viz.:

1. The strength of the specimen exceeds in each case that of the manufactured bar.

2. The uniformity of the results obtained from the tests of the bar ends, shows conclusively that whatever difference in strength there is between these bar ends and the manufactured eye bar, is properly ascribable to the mode of manufacture.

3. The results obtained from the "rolled" and the "upset" eye-bars approach nearest to the original bar strength, and give the best results. The difference between the results from these two methods is so trifling, and if anything—in the 0.30 per cent. carbon group—slightly in favor of the upset bar, that it leaves no doubt in my mind that these two processes are equally good.

4. The results from the "welded" bars show that while steel can be perfectly welded, there is a loss of nearly 30 per cent. of ultimate strength as compared with the original bar; moreover, the elastic limit is too near the ultimate strength, and the percentage of elongation too small to give sufficient warning of impending failure. It will, therefore, be safe to conclude that welded members in steel construction, while no worse than welded iron ones, are not desirable, and, in fact, ought not to be admittted at all, except where the grade of steel used is very low, and then the greatest caution in working and annealing will be required.

The results obtained from the experiments with eye-bars from 0.50 per cent. carbon steel, bear out very fully the above conclusions. Another group of nine eye-bars, made of 0.40 per cent. carbon open-hearth steel is now under preparation for testing, and until this intermediate grade is tested, a full comparison is not possible. It will, therefore, suffice to state here in a general way, that this group of bars from 0.50 per cent. carbon steel gave somewhat better results in the "rolled" bars than in the "upset" ones, while the loss in the "welded" bars, notwithstanding perfect welds, was so great as to clearly establish the fact that welding of high grade steel for purposes of construction is out of the question in general practice.

The next series of tests, which I beg to submit to your consideration, are plate tests, made upon rolled plates from 0.30 per cent., 0.40 per cent. and 0.50 per cent. carbon "open-hearth" steel, respectively.

To obtain primarily a fair average of the strength of the plates as they came from the rolls, and to establish therefrom a coefficient for the different percentages of carbon, three groups of 5 each, according to carbon percentage, were tested, with the results given in Table III.

The next step in the investigation was to establish the difference in the strength of the plates in the direction of the rolling and across it. As it was immaterial what the dimensions of the plates or test pieces were, so long as they admitted of a fair comparison of the results, and as it was, at the same time, important to find out what influence the relative proportion of width to thickness of plate might exercise upon the results, plates of different carbon percentage were rolled of different thicknesses and widths. Table No. IV shows carbon percentage and dimensions of the rolled plates and the specimens cut therefrom.

As it would carry us too far to examine the results of the above 54 tests in detail, the table following, No. V, contains only the average results obtained in the 0.30 per cent., 0.40 per cent. and 0.50 per cent. carbon plates respectively by cutting out the specimens in the planer, both in the direction of the rolling and across it.

Before entering upon the discussion of the results presented in Table V, it may be proper to state here that both the sheared and punched specimens showed an equal similarity of strength between lengthwise and crosswise resistance.

It would seem, therefore, that the conclusion that *in steel plates the resistance to tearing is the same, either in the direction of the rolling or across it*, is fully warranted, borne out, as it is here, by 54 tests, made on steel plates of three different percentages of carbon, and of different thicknesses and widths.

A remarkable feature of the results, as given in Table V, is to be found in the gradual *decrease of ultimate strength* in the three groups, with a corresponding *increase of carbon percentage*. Paradoxical as this may seem, the explanation is not far to seek. By referring to Table III we find no such result, but, on the contrary, the ultimate strength in each group increases with the increase of carbon; but then the plates were of the same thickness and width, or, in other words, the ratio of thickness to width was the same throughout the whole series of tests, and, moreover, the plates were tested just as they came from the rolls. In Table V, on the other hand, we find that not only had the specimens been prepared in the planer, but also—as is stated in the fourth column—the ratio of thickness to width changed in each group and was most favorable to the lowest grade specimens.

To these two circumstances are undoubtedly attributable the remarkable results of Table V; and when we consider further that this peculiar appearance of greater strength in the lower grades is maintained throughout the whole series of tests on the effects of shearing and punching, as will be subsequently shown, the conclusion seems inevitable that the *ratio of thickness to width is a factor of the highest importance in tensile tests*, and also that when deciding upon the value of a material for construction from specimen tests—unless all the attending circumstances of the investigation are known—the results ought to be taken *cum grano salis*.

To ascertain, now, the effect of shearing and punching upon steel, let us compare the results obtained from specimens of exactly the same size and from the same plates as those mentioned in Table V. As has been previously stated, the difference in the results between lengthwise and crosswise shearing and punching was found so diminutive as to give practically equal results; therefore, to make the comparison a perfectly fair one, the results in Table V will appear averaged in the following table, just as the results of the sheared and punched plates were averaged also. The results upon the effects of annealing or tempering after shearing or punching were obtained from precisely similar specimens, and are averaged from the same number of tests in each instance:

A careful comparison of the results in Table VI shows:

1. That both shearing and punching are injurious, *per se*, to all grades of steel, and cold punching far more so than shearing.

2. That both these operations affect the elastic limit—and this is the most important factor—far more than they do the ultimate strength.

3. That apparently the lower grades of steel are proportionately more injuriously affected than the higher grades. At this point the question naturally arises, How much or what proportion of the greater injury in the lower grades was due, in this case, to the greater thickness of the low-grade plates? A series of experiments in one carbon with plates of different thickness from the same run, is now in preparation, and will probably throw some light on this mooted point.

4. That the injurious effects of shearing and punching can be almost entirely counteracted by subsequent annealing or tempering in oil from a low heat.

5. That annealing restores the elastic limit to a greater extent than the ultimate, while tempering as above, on the contrary, largely increases the ultimate strength and ductility, but does not so fully restore the elastic limit.

The next set of tests refers to the relative value of drilled, reamed and punched holes. For this purpose strips of certain and equal widths were cut in the planer from the same set of plates.

Widths of plates, diameters of holes and tensile resistance, together with ultimate elongations of holes, will be found in Table No. VII. An analysis of the figures shows:

1. That the "reamed" hole is the strongest, and following in the order of strength

(*Continued on page 9.*)

* Results of an experimental inquiry as to the adaptability of steel to purposes of construction. From a paper read before the Engineers' Society of Western Pennsylvania.

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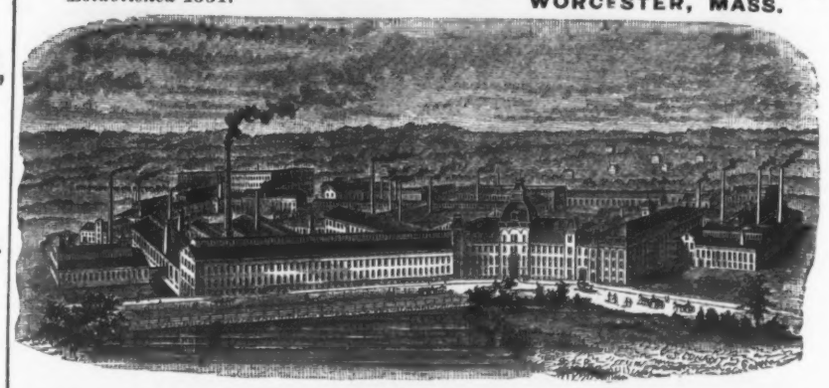
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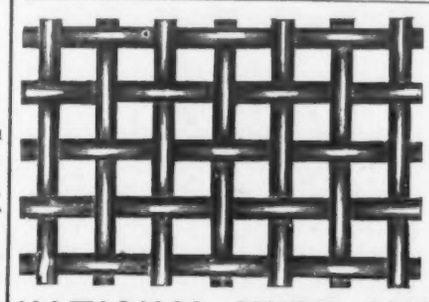
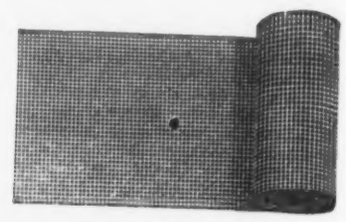
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(Continued.)

§ 12. *New York.*—[Held over until next week.]

§ 13. *North Carolina.*—Blackwell vs. Wright (73 N. C., 310, 1875). It was held in this case that every manufacturer has the unquestionable right to distinguish the goods he manufactures and sells, by a particular label, symbol or trade-mark, and no other person has a right to adopt his trade-mark, or one so like his as to lead the public to suppose the article to which it is affixed is the manufacture of the inventor. But before the owner of the trade-mark can invoke the power of the courts to prevent an infringement thereof, he must show a clear legal title to the trade-mark and a plain violation of it. If it appear that the trade-mark alleged to be an imitation, though in some respects resembling that of the plaintiff, would not probably deceive the ordinary mass of purchasers, an injunction will not be granted. The name of the town where both parties are doing business cannot be used as a trade-mark.

In this case plaintiff's label was as follows: "Genuine Durham Smoking Tobacco, manufactured by W. T. Blackwell (successor to J. R. Green & Co.), Durham, N. C.," with the picture of a bull in the center of the label, over which are the words "Trade Mark." He alleged that this was imitated by the label of defendant, which was on glazed paper of the same color and general appearance of plaintiff's, with the picture of the head of a bull in the center, and read: "The Original Durham Smoking Tobacco, manufactured by W. A. Wright." Injunction in the court below dissolved.

§ 14. *Ohio.*—McGowan, &c. vs. McGowan, (2 Cincinnati Superior C., Rep. 313, 1872). T. & J. McG., pump manufacturers, were partners as McGowan Bros. J. sold out to T. all his interest in the firm, including the old patterns, with the name of McGowan Bros. on them. T. and others procured a certificate of incorporation as "McGowan Bros. Pump and Machine Co." Held that J., who had set up a similar business, could enjoin the use by the corporation of the name "McGowan Bros." The old name is not a trade-mark, and while there is a right to use the old patterns with the name of McGowan Bros. on them, it cannot hold out by the corporation term that all the articles made by it were in fact produced by the skill and labor of J., or that the corporation is in fact the old firm composed of both brothers.

§ 15. *Pennsylvania.*—The decisions in this State are more numerous than in any other State except New York. They are, therefore, given under the form of a digest for convenience and perspicuity.

What may become a trade-mark.—A word which is the name of an article or indicates its quality cannot be appropriated as a trade-mark, *e. g.*, "Extract of Night Blooming Cereaus." Phelan vs. Wright (5 Phil., 464, 1864).

A trade-mark may consist of distinctive words, not in common use, descriptive of similar articles. The name of the inventor may form part of the trade-mark. *e. g.*, "Dr. J. N. Lindsey's Improved Blood Searcher." Fulton vs. Sellers (4 Brewster, 42, 1867); Ayer vs. Hall (3 Brewster, 509, 1871).

No right can be absolute in a name, as a name merely. It is only when that name is printed or stamped upon a particular label or jar, and thus becomes identified with a particular style and quality of goods, that it becomes a trade-mark. Rowley vs. Houghton (2 Brewster, 303, 1868); Ferguson vs. Davol Mills (id. 314, 1868).

It is requisite that the device should perform the office of a finger-board, and indidate the name and address of the manufacturer, to invest it with the attributes of a trade-mark entitled to protection. The letter K inclosed in a double ring with the letters "No." and "yds" between the rings, not a trade-mark. Ferguson vs. Davol Mills (2 Brewster, 314, 1868).

A trade-mark to be capable of exclusive use must be such as will identify the article to which it is affixed as that of the owner and distinguish it from those of others. Palmer vs. Harris (60 Penn. S. R., 156, 1869).

Title to the property in the name "Keystone Lime," acquired by many years certain, exclusive appropriation and use of it by shippers of merchandise who did not own the vessels employed by them will be protected in equity. Winson vs. Clyde (9 Phil., 513, 1872).

When an injunction will be granted.—To entitle the owner of a trade-mark to prevent its use by another person, there must be in the copy such a general resemblance of the form, words and symbols in the original as to mislead the public. Rowley vs. Houghton (2 Brewster, 303, 1868); Dixon Crucible Co. vs. Gugenheim, (id. 321, 1869). A sufficiently distinctive individuality must be presented, so as to procure for the person himself the benefit of that deception which general resemblance is calculated to produce. Rowley vs. Houghton, supra.

The jurisdiction of a Court of Chancery in trade-mark cases attaches because of the injury to the one whose goods are simulated by interfering with his profits, not because of the deception upon the public. Dixon Crucible Co. vs. Gugenheim (2 Brewster, 321, 1869).

Defendant put up a sign—"Dr. F. R. Thomas, formerly operator at the Colton Dental Rooms." The words "formerly operator" were very small—the others very large. Held, that the use of the sign was fraudulent, as against owner of the Colton Dental Rooms. Enjoined. Colton vs. Thomas (2 Brewster, 308, 1868).

Defendant will be enjoined against the use of his own name when the same has been employed by him as a trade-mark and sold to another, with covenant not to use the trade-mark. Ayer vs. Hall (3 Brewster, 509, 1871).

When an Injunction will be Refused.—The label of the plaintiff was printed upon pinkish paper—"Aremingo Mills; warranted indigo blue." The label of defendant was printed on paper with a fanciful deep pink border—"Superior domestic pure linen goods, manufactured by William Baird, at Aremingo Mills, Frankford, Pa.; warranted fast colors." The words "Aremingo Mills" were printed in small capitals. The size of the labels was different; the color different; the size of the letters, &c., except the words "Aremingo Mills," were distinct. Injunction refused. Calladay vs. Baird (4 Phil., 139, 1860).

A trade-mark in the Spanish language, on cigars made in New York, indicated that they were made in Havana. Injunction refused, because the mark gave a false indication. Gillis vs. Hall (2 Brewster, 324, 1870).

The plaintiff had adopted a trade-mark so recently as not to have become known to the trade. Defendant, in entire ignorance of the fact and without any apparent design or intention, used the same words as a part of his trade-mark. Injunction refused. Seltzer vs. Powell (8 Phil., 296, 1871).

Plaintiffs claimed the use of the name "Galaxy Publishing Company" as a trade-mark. There was no such corporation. Held that if plaintiff's firm name falsely implies that they are a corporation a court of equity will not assist them. McNair vs. Cleare (31 Legal In., 212, 1874).

The name of an incorporated borough cannot be held as a trade-mark to the exclusion of other residents of the borough. This is so, though the trade-mark was adopted before the incorporation of the borough and before there was any town in that place. A corporation adopted the trade-mark "Glendon" on their iron. The place where their furnaces were was afterward made a borough by the name of Glendon. Another company afterward used the mark "Glendon" on their iron. Held that the second company could lawfully use this mark. Glendon Iron Co. vs. Uhler (75 Penn. S. R., 467, 1874).

Title.—The purchaser of a trade-mark and the right of manufacture of the article designated by it may be protected by injunction. He need not designate himself as assignee. Fulton vs. Sellers (4 Brewster, 42, 1867); Dixon Crucible Co. vs. Gugenheim (2 Brewster, 321, 1869). A person may sell a trade-mark which contains his own name, and covenant not to use the same. Ayer vs. Hall (3 Brewster, 509, 1871).

The use of the name "Keystone line" by a steamship company while the shippers were its agents is a mere license, and gives no right to its use after the agency is terminated. Wilson vs. Clyde (9 Phil., 513, 1872).

§ 16. *Rhode Island.*—Davis vs. Kendall (2 R. I., 566, 1850). Plaintiff was the inventor of a medicine which he called "Pain Killer." Defendant put up a medicine in similar packages, calling it "J. A. Perry's Vegetable Pain Killer." The court said: "Trade-marks may be, first, the name of the maker; second, symbolical; third, the name of a compound. Of this last kind is the trade-mark of the plaintiff—"Pain Killer." All are entitled to make and vend this compound, and to vend it as a similar article to that made and sold by the plaintiff; but no one but the plaintiff has a right to sell it as a medicine manufactured by the plaintiff. * * If the defendant states in his label that the article which he sells was made by himself, although he calls it by the same name as the plaintiff's, he will not be liable, because he has a right to make and vend the compound, if he vends it as his own and not as made by the plaintiff. If the defendant, without fraud, use the trade-mark of the plaintiff, he is still liable. The whole question in this case is whether the defendant's label is liable to deceive the public, and to lead them to suppose they are purchasing an article manufactured by the plaintiff instead of the defendant." Judgment for the plaintiff.

Barrows vs. Knight (6 R. I., 434, 1860). In this case it was decided that "Roger Williams' Long Cloth" was a good trade-mark.

A. Carmichel & Co. vs. Latimer, Stillman & Co. (11 R. I., 395, 1876). A. C. & Co. being the successors, by purchase, of Stillman & Co., woolen manufacturers, continued to use "Stillman & Co." as a trade-mark. Latimer, Stillman & Co., the lessees of a mill formerly used by Stillman & Co., known both as "Stillman Mill" and "Seventh Day Mill," used "Stillman Mills" as a trade-mark. On a petition for an injunction against defendants to prevent their using the word "Stillman"—it appearing that no deception could be charged on the defendants, and that no person of the old firm of Stillman & Co. was a member of A. C. & Co.—an injunction was refused because a manufacturer has a right to label his goods with his own name or that of his mill, if no fraudulent purpose is intended. The question was raised (but not decided) whether a trade-mark whose reputation depends upon the excellence of the manufacture or the skill and honesty of the manufacturer, can be assigned.

§ 17. *Wisconsin.*—Dunbar vs. Glenn (42 Wis., 118, 1877). The owner of a natural product (as the water of a mineral spring) is entitled, like the manufacturers of artificial products, to have his trade-mark protected. When a particular word or combination of words, used as a trade-mark, distinctly points to the origin and ownership of the article to which it is applied (and which is not a generic word or geographical name of place of origin), it will be protected. The word "Bethesda" is a good trade-mark of natural mineral waters.

Ironstone in the North of England.—At a recent meeting of the Cleveland (England) Institution of Engineers, Mr. G. Barrow gave some interesting data in regard to the extent of the iron ore deposits upon which the great iron industry of the North of England is dependent. He stated that all the good ironstone was in a line bringing in Eston, Upleatham, and the Skelton and the Huntcliffe districts. The seam was calculated at 1 foot in thickness. At Eston there were some 86,400,000 tons of stone; at Normanby, 8,300,000; at Ormesby, 2,600,000, and at Dinsdale some 3,250,000 tons. Taking the output as at present, Eston would be exhausted in 75 years, Normanby in eight years, and Ormesby in 15 years. In the Upleatham district there were some 36,100,000 tons, calculated to last 25 to 30 years. The area of good stone left in Skelton and Huncliffe was 48,000 acres, or 173,000,000 tons, which might

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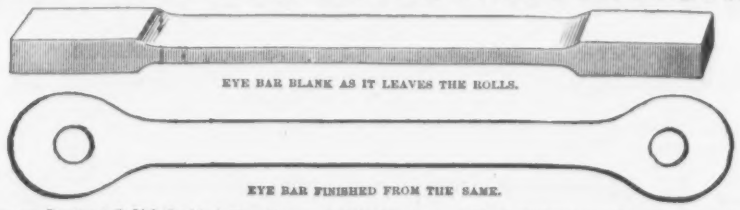
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last 60 years. The main "strip" in the poorer districts was about 13 miles wide by 2½, the quality being very poor. It consisted mostly of 4 feet of stone with 2 feet of shale parting it in the middle. The total amount it would pay to work in fairly good times might be roughly estimated at 375,000,000 tons, which, at the present rate of output, would last 130 years.

Modern Uses of Emery.

Of late years the use of emery in the machine shop and the manufactories of the metals has become very general—not confined, as formerly, to its application with oil, or by means of emery cloth and emery paper, nor to the polishing of a few articles by the use of a wooden wheel faced with emery; but solid wheels of emery of different grades of fineness, the wheels being adapted in size and shape to particular jobs, are used in every shop where pretensions to rapid and economical work are made.

Emery is nearly pure alumina, of the same nature as the sapphire, small sapphires being frequently found in corundum, or adamantine spar, a purer and harder quality of emery. To its hardness and the angularity of its crystals is due its value as a cutting material for reducing metals, and this angularity remains even in the flour of emery, which is so fine as to be an impalpable powder, giving no sense of grittiness when rubbed between finger and thumb.

The variety of the applications of emery is too great to be even enumerated without prolixity. It is sufficient to say that this material has, in a greatly economical measure, taken the place of the file and of the hard work of draw filing and hand polishing. Articles of iron just from the lathe or planer are submitted to the emery wheel, and in a small portion of the time heretofore required are brought to the requisite polish and finish. Every well-appointed shop has its sets of wheels, and usually a polishing room, where all of this description of work is done. There are a number of manufactories of emery wheels bearing different names and laying claim to particular excellences; one shop affects one make and another concern holds by another; but it is probably the fact that wheels of different makers are preferable for a variety of work, as the matrix of material used in agglomerating the particles of emery is of a different nature in different manufactories. Still, in many shops, to this day, the old-fashioned wooden wheel, with its leather-covered face and emery drawing, is preferred for general work, and for fine polishing nothing excels a wheel made of the hide of the hippopotamus or the walrus, andeven wheels of cotton cloth are used with cake emery.

But the modern uses of emery are not confined to polishing or surfacing. The emery wheel is applied to the same use as the rotary steel cutter, and it makes a very efficient cutter. The range of its work is surprising to one who remembers the machine shop only as it was twenty or thirty years ago. Among its applications are "gumming" circular saws—cutting away the material between the teeth—dressing castings, trueing the surfaces of cylindrical bodies of chilled cast iron or hardened steel, finishing forgings, grinding lathe and planer tools, the heavy knives used by curriers in splitting sides of leather, grinding straight and spiral-tooth rotary cutters, drills, fluted reamers, taps, dies, tools for cutting moldings, chisels, gouges, planer knives, paper-cutting knives and the blades of scissors and fine pocket cutlery. In addition to these uses, the emery wheel, mounted on a frame adapted to the purpose and furnished with the proper appliances, may be used in place of a planer, pillar shaper or milling machine for finishing, from the forge, gibs and keys and other articles requiring a perfectly plane surface. The depth of the cut of the wheel's surface can be as accurately gauged and determined as that of a steel cutter. A soft emery wheel—one on which the emery is secured to an elastic surface like leather—is sometimes used to draw the temper of small hardened steel articles. In home-made or dressed wheels of wood or leather or of hide, the emery is secured to the surface by means of hot glue, or by a solution of gum shellac in alcohol; but in most solid wheels the entire wheel is composed of emery, the particles being held in place by some substance as a matrix, and cohesion and solidity being assured by immense pressure by means of the screw or hydraulic press. The material used to cohere the particles of emery varies with different manufacturers, and in some cases it is held as a trade secret; but combinations of glue, lac, caoutchouc and similar substances, with modifying ingredients, are employed. The composition of gum camphor and gun cotton, known as celluloid, is also used, the claim being made that this composition outlasts others and does not so readily glaze.

When an emery wheel glazes it must be turned. This at first sight seems to be a difficult job, as the emery is so hard that it is used for working almost all the precious stones except the diamond; and the diamond, in one of its forms, is the very material used for razing the emery wheel. The variety used is the massive diamond known as "bort," or black diamond, such as is used in the diamond saw and diamond drill. One of these diamonds is fixed in the end of a piece of steel, as is the glazier's diamond, and held against the rotating emery wheel in the same way as a turner's chisel, gouge or hand tool. One variety of the solid emery wheel—the vulcanite—does not require the diamond tool, but is turned—or rather, trued—either with a red-hot iron or an ordinary turning tool, the surface of the wheel being warmed by a gas jet or spirit lamp as the wheel rotates.

The dredging engineers Morris & Cummings, of this city, who have the contract for excavating a canal through the lagoon between Cronstadt and St. Petersburgh, will resume work as soon as navigation opens, which it is expected will be about the 15th inst.

Mr. Philip Grant, one of the earliest pioneers of factory legislation and the Ten Hours Bill, died on the 6th inst., at an advanced age, at Manchester, England.

A. H. McNEAL & BRO.,
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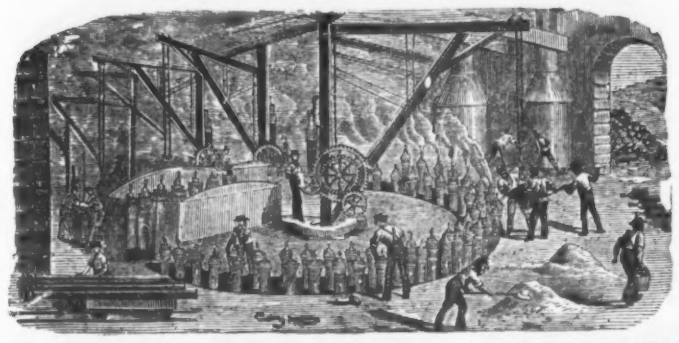

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For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

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For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

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For Shafting, Spindles, Rollers, &c., &c.

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"Iron Center" Cast Plow Steel.
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Finished Rolling Plow Coulters with Patent Screw Hubs attached.
Agricultural Steel cut to any pattern desired.
Steel Forgings made to order.

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TIRES AND AXLES
OF EVERY DESCRIPTION.

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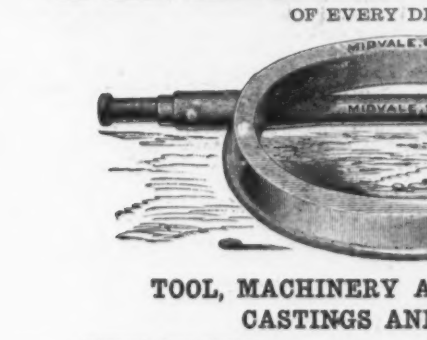
Steel Rails, Frogs, Crossings & Switches.
Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.
Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.
Address all orders to
PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.



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Manufacturers of
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NOISELESS STEAM MOTORS,
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These machines are nearly noiseless in operation; show no smoke with the use of anthracite coal or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse cars and draw additional cars. Circulars with full particulars supplied.

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Pig and Railroad Iron.
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Roofs. Stairs. Floors.
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Bridles, Truss Plates and Bolts, for Wood Beams.
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Stable Fixtures, Mangers Stall Guards, &c.

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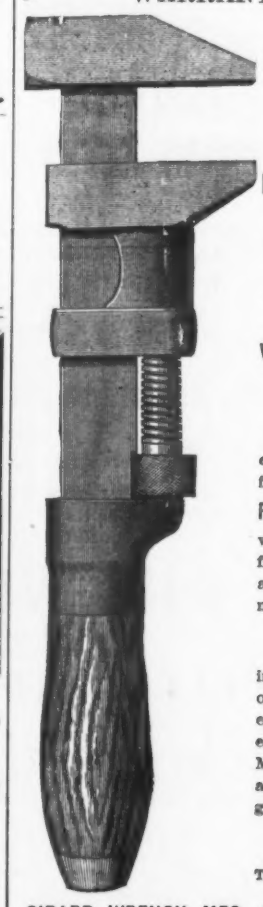

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Forgings of every description.
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Per lb.	26¢	23¢	21¢	20¢	19¢	18¢

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This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore	$4.00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do	12.50
For each additional constituent of usual occurrence	1.50
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For determining the per cent. of Sulphur or Phosphorus in Iron or Steel	7.00
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For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone	10.00
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For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an ore.

For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.

Printed instructions for obtaining proper average samples for analysis furnished upon application

The Manufacture of Spiegeleisen in Germany.

Following a description given by Herr Hartmann, of the School of Mines, Mr. Jeans publishes, in his new work on steel, the following data on the materials for and the methods of manufacturing spiegeleisen in the Siegen district, Rhenish Prussia. His account will be of interest as exhibiting the main features of the work in that ancient district, still pre-eminent in its speciality. Comparatively unknown and unappreciated previous to the introduction of the Bessemer process, manganiferous pig iron or spiegeleisen has become a necessity to many steel works, and considerable quantities are imported from abroad into this country. Previous to 1860 all the pig manufactured in the Siegen district was made with charcoal, and it was only after some unsuccessful attempts that its substitution by coke was accomplished, and there are at the present time a number of blast furnaces, each producing daily some 30 tons of this valuable and peculiar pig metal. The iron ores used are of four different kinds.

1. Red hematite, a very pure ore, from the beds existing on the Lahn, a large tributary of the Rhine at Nassau. Of this ore there are two varieties, a harder and compact mineral associated with a calcareous gangue, and a softer and pulverulent hematite. Both varieties are entirely free from sulphur and phosphorus, containing from 3 to 4 per cent. of manganese, a small percentage of alumina, water and silica. The presence of carbonate of lime in the body of the compact ore gives it a peculiar character, and renders it eminently fitted for mixing with other siliceous ores, there being in the ore 50 per cent. of iron and from 10 to 15 per cent. carbonate of lime. This ore is very economic in smelting, owing to the presence of lime flux in the most favorable conditions. The soft pulverulent ore is richer, yielding 55 to 58 per cent. of metallic iron in the practical working of the furnace. Both kinds are easily reduced. 2. The products from decomposition of the specular ore—the German "Brauneisenstein"—has a similar favorable constitution, and is equally free from obnoxious metalloids. It contains some water chemically combined ($2FE_2O_3$, 3 H O), is porous in structure, yields 50 to 54 per cent. of iron, and is more easily reduced than any other ore. 3. Excellent spathic iron ore from the vicinity of Müsen (Stahlberg), in which a certain proportional part of the iron—from 8 to 14 per cent—is replaced by manganese. All the spathic ores (Fe O, CO_2) contain a trace of sulphur, and therefore require calcination. The latter is effected in kilns of special construction. In these roasting furnaces, by distributing it in alternate layers with waste coal, the ore is rendered porous, and is easily broken into small pieces, whereby it is more readily acted upon in the smelting furnace. The chemical constitution of the ore in the crude state is $MnO, CO_2 + 4$ Fe O, CO_2 = oxide of iron 49.01; oxide of manganese, 12.43; carbonic acid, 38.56. The oxide of iron represents 37.85 per cent. of metallic iron. By the calcining process the ore is changed into sesquioxide of iron 81.89 (representing 56.78 metallic iron), and sesquioxide of manganese 18.11 per cent. 4. An aluminous ore, used for admixture with the others, to make a good-natured slag. These deposits of ore are from 80 to 100 miles distant from the works, and are easily accessible by navigation and by rail. To convey the ores from Nassau to the iron manufacturing center involves a navigation of 75 miles at a cost of about 5/ per ton, in addition to dockage and transfer from the docks on the Rhine, making the entire cost of the ore (including purchase money) about 14/ per ton in 1872. The flux used is a very pure carbonate of lime, obtained in the vicinity of the iron works from the borders of a small creek, the Düssell, the constituents of which are—carbonate of lime 98.00; silica, 1.50; hygroscopic water, 0.50. As a reducing agent coke is used, the bituminous coals being purified prior to their application to the blast furnaces. The coals are from the vicinity of the iron works, and the ores are brought thither, for it is always cheaper to bring the iron ores to the coal than the coal to the ores. They contain a good deal of slate, and from 5 to 1 per cent. of sulphu-; and to eliminate these, they are subjected to a very careful process of grinding (to the size of a hazel nut) and separating by means of water. Having been subjected to this process the coals are coked in close furnaces of the Franzois' system, the charge of each furnace of 120 scheffel (bushels) covering the bottom of the furnace to a hight of 18 or 20 inches.

The coking process lasts 36 hours, and furnishes from 57 to 60 per cent. of coke, by weight, of porous cellular character, sufficiently firm to hold up the burden of the furnace, and containing 8 to 10 per cent. of ashes of a reddish white or gray color. The volatile carbonic matter of the coals, after having been used to heat the partitions and floors of the coking furnaces, are sufficient to generate steam. The blast is supplied by two 80-horse horizontal engines, manufactured at the Seraing Works, to four blast furnaces; one vertical 100-horse engine and a fifth stove being in reserve. The blast is regulated by being passed through a reservoir 200 feet long and 6 feet diameter=4654 cubic feet. The principal dimensions of the horizontal engines are: Diameter of steam cylinder, 3 feet 3 inches; diameter of blast cylinder, 7 feet 6 inches; length of steam cylinder, 6 feet; each revolution of the fly-wheel would therefore give 1060 cubic feet only; 18 or 19 revolutions per minute, allowing 12 per cent. for loss by leakage, 16,800 cubic feet. The vertical engine has: Diameter of steam cylinder, 3 feet 3 inches; length of cylinder, 7 feet 9 inches; diameter of blast-air cylinder, 8 feet. By 13 revolutions per minute there will be 18,000 cubic feet of air, less 10 per cent. for leakage. Before being forced into the furnace the blast is heated by means of the gases escaping from the mouth of the furnace and collected there by means of a special apparatus. It is found that two stoves of a special form are sufficient to heat the blast air of each furnace. These stoves each have 52 pipes, the latter being divided by means of a partition into two parts, so that the blast may ascend and descend in each pipe. The latter are each from 10 to 12 feet long; the surface exposed to the fire is 2429 square feet, and the cubic contents of the 52 pipes, 460 cubic feet. The dimensions of the blast furnaces, there being two groups of stacks, are:

	No. 1. Ft.	In.	No. 2. Ft.	In.
Hight of furnace	54	0	54	0
Diameter of tunnel head	8	8	9	6
Diameter of boshes	15	2	15	3½
Diameter of hearth, upper end	4	9	3	11½
Diameter of hearth, lower end	4	9	2	10
Hight of hearth	6	3	7	9½
Hight of boshes	11	9	10	3¼
Hight of center of tuyeres above bottom	2	5	2	5
Inclination of the boshes	50 deg.			
Square contents of the mouth	59	0	72	0
Square contents of the boshes	180	0	183	0
Cubic contents of the whole furnace	6396	0	5910	0

The bottom and lower parts of the hearth up to 3 feet above the tuyeres are built with puddingstone from Marchin, in the Ardennes, Belgium, and for the upper-hearth boshes and tunnel of the furnace, Ardennes fire-clay bricks are used. It must be remembered—for this was what caused so much trouble and meditation to the iron-masters — that speigeleisen is chemically composed of four parts iron with one part carbon (Fe_4C), and that the combination is only formed during the period of the smelting process, which follows immediately after the deoxidation of the iron ores. To fulfill the conditions under which this combination of iron and carbonic matter can take place, it is absolutely necessary that the mixture of ore and flux be of the most fusible nature, so as to allow of the accumulation of the charge—in proportion to a fixed amount of coke—to such a degree that the smelting and separation of the iron from the slag occurs at a point as near as possible to the tuyeres. It is safe to say that this separation, when resulting at a higher place in the hearth, would give too great an opportunity for the carbonic-acid gas to carry off some of the carbonic matter from the iron, charging itself into carbonic oxide and reducing at the same time the constitution of the spiegeleisen (Fe_4C) to a lower grade of carbonization. The temperature at which the specular iron melts is calculated to be 3582° F. It is, therefore, found necessary that the charges should be composed of red hematite, 30 per cent.; spathic ore, 38 per cent.; decomposed brown ore, 20 per cent.; and aluminous ore 12 per cent.; yielding 40 to 50 per cent. metallic iron in the practical working of the blast furnace, and to create the needed fusible slag there was added from 32 to 40 per cent. of lime. Each charge consisted of 1860 pounds coke, 2800 to 3200 pounds mixed ore, and 800 to 960 pounds carbonate of lime. The furnace carries 35 to 40 charges in the 24 hours, and yields an average of 60,000 pounds, or 30 tons a day. For 1 ton of pig metal there were used 2 tons of iron ores, nearly 13 cwt. of fluxing materials, and 1¼ tons of coke. The blast, with a temperature of 630° to 660° F., is forced into the furnace at a pressure of 2½ to 3 pounds per square inch at the engine, and of 2.2 to 2.6 at the tuyeres. Out of the five tuyeres two are on opposite sides, and one at the rear of the furnace; each one declined a few degrees from the center of the hearth, so as to force the blast air into a kind of whirlwind, which is considered the best way of distributing the compressed air through the smelting and combustible mass.

Commercial Law.

Condition and Custom.—A condition in a policy of life insurance that it shall be void unless the premiums are paid at the times specified, may be waived by a custom on the part of the company of receiving premiums on said policy at other times. Where, under such a custom, the last premium was paid after the specified date, an insertion in the receipt therefor of the words "and policy holder in good health," made by the company before sending the receipt, would not relieve it of liability, although the insured was, in fact, sick of the disease of which she afterward died.—*Cotton States Life Insurance Co. vs. Lester, Supreme Court, Ga.*

Alteration of Instrument.—Material alteration of a note or bill after execution and indorsement by surety, or either payee or maker, without the surety's consent, operates as a release of the surety. The alteration need not be to his prejudice in order to work his release. And an erasure of a seal after the name of a surety is a material alteration in the sense of the law. But a mere disfigurement or blot placed upon the face of an instrument by accident or by a stranger, is only a spoliation, and not an alteration of the instrument.—*Organ vs. Allison, Supreme Court, Tennessee.*

Although the promptness with which the English Board of Trade reports of exports are published renders the later returns of imports given by our Bureau of Statistics of less interest, it may be surprising to many to see how exclusively the masses of iron now coming to us are sent by England. Of course, the quantities sent in one month from England and those received here are not equal, the cargoes shipped during the second half of one month being credited to the following one in the statistics of this country. Placed side by side, we have for January and February:

Articles.	American imports		British shipments.	
	Jan.	Feb.	Jan.	Feb.
Pig iron	74,284	59,814	56,570	69,651
Iron rails	5,044	6,448	7,941	6,608
Steel rails	4,152	6,068	7,350	6,162
Old scrap	56,879	48,858	24,972	29,529

This table strikingly shows that while the bulk of the manufactures of iron specialized comes from England, we have other sources of supply for old iron and scrap.

It is announced that an English company which was organized to promote the introduction of glass railway ties, now propose to manufacture toughened glass pipes for water and gas, for drains and chemical apparatus; also transparent boilers.

The Edison light has been put into the new iron steamship Columbia, built for the Oregon Railway and Navigation Company by John Roach & Co., of Chester, Pa. It is used for illuminating the staterooms.

(*Continued from page 1.*)

Steel in Construction.

come the "drilled," the "punched and annealed," and, lastly, the "cold-punched" hole. This graduation is well defined in all three groups. That the reamed hole should be stronger than the drilled hole I am unable to account for.

2. That the injurious effect of punching is local, and can be entirely removed by enlarging the hole sufficiently with either drill or reamer. The amount of drilling or reaming required after punching varies with the thickness of the plate and the grade of the steel.

3. That although annealing is in a measure beneficial in partially restoring strength and ductility to the punched plate, it will be hardly found available for bridge work, for, if you attempt to anneal before riveting, the holes will not fit; if after riveting, you create internal strains of which no account can be taken, and which may subsequently produce failure. Moreover, with proper machinery, punching and reaming will be found much cheaper than "punching and annealing."

In order to establish next the relative value of iron and steel rivets, pieces of steel plate with drilled, reamed and punched holes were machine riveted, both with iron and steel rivets. Sections of plate and rivet were then cut in the planer and afterward treated with acids. The photograph of these sections which are now before you shows very plainly:

1. That upsetting affects iron far more injuriously than it does steel, and that, therefore, the iron rivet, irrespective of its lesser resistance to shear, is, *per se*, the weakest.

2. That the punched hole cannot be filled by either iron rivet or steel rivet.

3. That the reamed hole is the one most completely filled by both the iron and steel rivet. From these facts, and some tests made upon the resistance of rivet iron to shear, and which gave me invariably smaller results for the same iron when sheared in steel plates than when sheared in iron plates, it will be safe to conclude that iron rivets should not find a place in steel construction, except in those rare cases where hand riveting is unavoidable, as it is never safe to employ this latter method of riveting on steel rivets. A section of an iron plate sheared on the edges and with a punch-hole in the center was cut in the planer and also treated with acid, which brought out the severe distortion the fibers undergo in these operations.

In conclusion, permit me to lay before you a transverse test of a riveted steel beam. The composition of the girder was as follows, viz.:

Web, 0.50 C. rolled steel plate, 3-16 x 12 inches.

Flanges, 2½ x 2½ x 5-16 inch steel angles, and 3-16 x 5½ inch top and bottom plates.

Rivet holes drilled 9-16ths of an inch diameter.

Rivets, one-half inch diameter; pitch, 4½ inches.

Effective depth, 12 inches; effective area, 8.51 square inches.

Clear span between supports, 5 feet.

The girder was put into the press without side supports, and the load applied in the center.

The test results are given below:

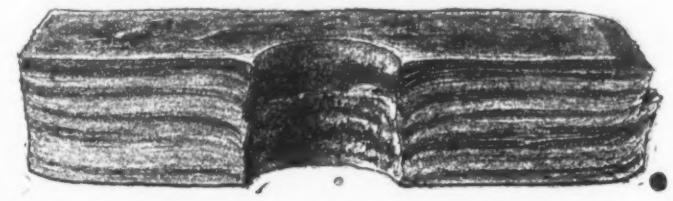
VIII.—EXPERIMENT ON 12 INCH RIVETED STEEL GIRDER.

Weight, 110 pounds per yard.
Effective Area, 8.51 square inches.
Clear Span, 5 feet.

Center Load in lbs.	Deflection in inches.	Increase. Inches.	Remarks.
20,000	.0625	...	
30,000	.0937	.0312	Released. No set.
20,000	.0625	....	
30,000	.0937	.0312	
40,000	.1250	.0313	
50,000	.1875	.0525	Released. No set.
40,000	.1250	....	
50,000	.1563	.0313	
60,000	.2187	.0624	
70,000	.2500	.0313	Released. No set.
60,000	.2187	....	
70,000	.2500	.0313	
75,000	.2813	.0313	
80,000	.2969	.0153	
85,000	.3438	.0469	Released. Set, .0625
90,000	.1750	.0312	
100,000	.6250	.2500	
120,000	.7500	.1250	Released. Set, .2500
130,000	.9375	.1870	Released. Set, .5000
130,000	.9375	....	Load remaining. Side deflection begins. Released after 20 min. Set, .50.

Comparing the results obtained from this beam with the standard loads adopted for rolled iron beams, it will be readily seen that more than double the weight of iron similarly disposed would be required to obtain a like result.

If these hurriedly recited experiments and tests prove anything at all, they prove the wide range of application of which steel is capable in construction, and how imperative the thorough investigation of this subject has become in modern engineering. They are, perhaps, also a wholesome warning to the constructor that it is not wise—in fact, rather otherwise—to depend upon a few specimen tests as a criterion of the value and character of a comparatively new material in construction.



Iron Plate with Punched Hole and Sheared Edges.

It is beyond all question, moreover, that in adopting steel for purposes of construction, our present methods of dimensioning will have to undergo considerable modification; that our present so-called safety factors, based as they are entirely upon an assumed ultimate strength, become almost meaningless when we have to proportion in steel; and last, but not least, that our mechanics must learn to treat steel as steel, and not as iron.

Steel construction is undoubtedly *the* construction of the near future. The conservative element in our profession which opposes it to-day will probably oppose it 20 years hence, just as it took them 20 years to learn to believe that iron was better than wood.

This conservative element is not without its use; neither are sand-bags in aerial navigation. To carry out the comparison, let me add that their function and their destiny are alike. They serve very well to steady our flight in the lower levels—to reach a higher altitude they must be thrown overboard.

I ought not to conclude without availing myself of this opportunity to express my obligations to Messrs. J. M. & J. B. Cornell, of New York, and the Keystone Bridge Co. and Mr. Kloman, of Pittsburgh, for their many courtesies and valuable assistance in placing men and machinery at my disposal during a most busy season in their works, and also to Mr. James E. Howard, in charge of the United States Testing Machine at Watertown Arsenal, for his conscientious and faithful work.

TABLE I.—SPECIMEN TESTS OF BAR ENDS, 30 INCHES LONG, DESIGNED FOR EYE BARS.

Mark and Carbon.		Tensile stress per square inch at		Averages.		Stretch per cent.		Reduction of area, per cent.	
		Elas. lim.	Rupture.	Elas. lim.	Ultimate	Each.	Average.	Each.	Average.
1	0.30 per cent...	55,712	94,760	55,635	95,390	15.1	14.3	30.	28.6
2		56,009	95,380			12.9		26.	
3		55,120	95,830			15.3		31.	
4		55,830	96,020			14.5		27.	
5		55,512	94,970			13.8		29.	
1	0.50 per cent...	65,790	112,340	65,904	112,630	10.8	10.1	19.	19.6
2		66,040	112,470			8.9		16.	
3		66,160	111,980			10.5		22.	
4		65,550	113,320			10.9		21.	
5		65,980	113,040			9.4		20.	

II.—EXPERIMENTS MADE ON O. H. STEEL EYE BARS MANUFACTURED BY DIFFERENT PROCESSES.

Mark.	Carbon. Percentage.	Dimensions of			Mode of manufacture.	Tensile stress per square inch in lbs. at		Stretch. Percentage.		Reduction of area. Percentage.	
		Stem.	Head.	Pin-hole.		Elastic limit.	Rupture.				
B1	0.30	3 in. × ⅞ in. × 10 ft.	1¼ in. thick 7½ in. across eye.	3½ in. diameter.	Upset.	54,026	87,400	8.2	8.1	44.	44.
B2	0.30					54,113	94,500	9.2		46.	
B3	0.30					54,113	89,300	7.0		42.	
						54,083	90,400				
F1	0.30				Rolled.	51,762	92,672	8.2	9.2	0.0	34.5
F2	0.30					54,065	91,570	9.3		29.	
F3	0.30					52,518	94,780	11.8		40.	
						52,781	93,007				
A1	0.30				Welded.	58,473	69,140	2.0	2.3	Measurements not taken.	
A2	0.30					56,059	63,000	2.6			
A3	0.30					55,310	69,400	2.2			
						56,614	67,180				

FRACTURES.—Specimens B1, B2 and B3, broke 1′ 3″, 4′ 3¼″ and 1′ 8¼″ from pin-hole respectively, the fracture being fine, silky and wedge-shaped. Similar characteristics were noted in F2 and F3, the distance of the fracture from the pin-hole being 5′ 2¼″ and 2′ 1¼″. F1 broke in the head into three pieces, and showed the effect of overheating; fracture coarse and granular. A1, A2 and A3 broke in stem, close to neck, 5¼″, 5½″ and 5⅜″ from pin-hole; fracture close grained, 50 per cent. granular, and showing effect of welding heat. Weld in head perfect in all three, but defective at junction of stem and neck on account of welding pieces being too small.

(*Continued on page 11.*)

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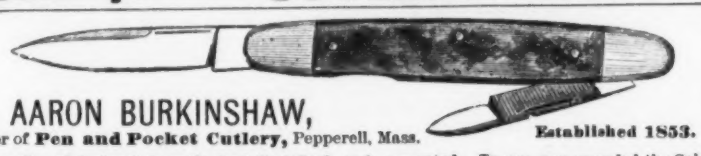

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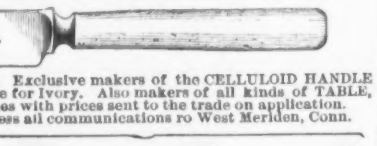

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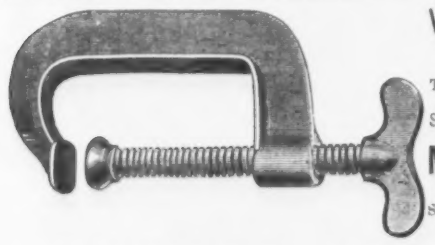

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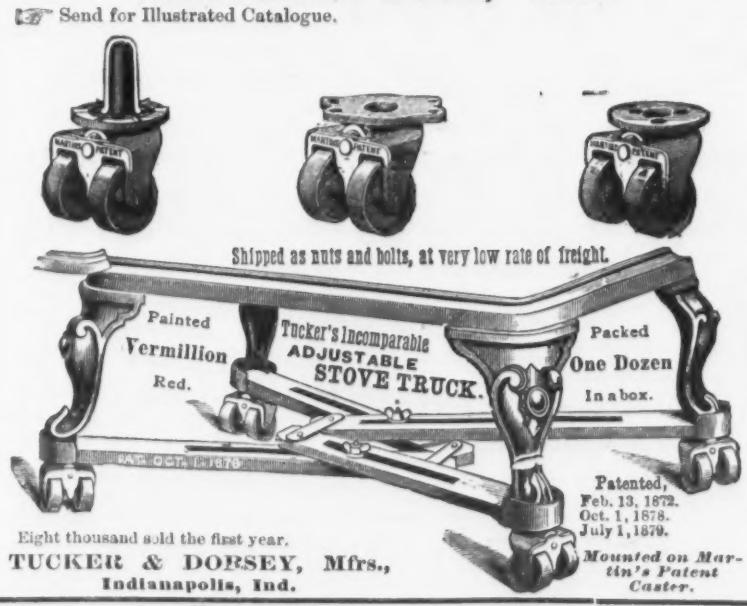

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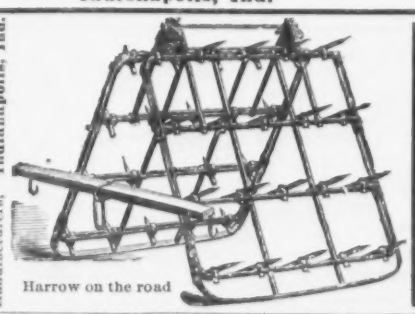

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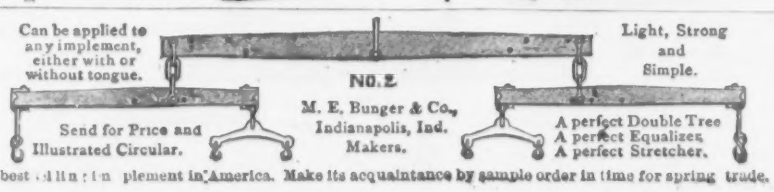

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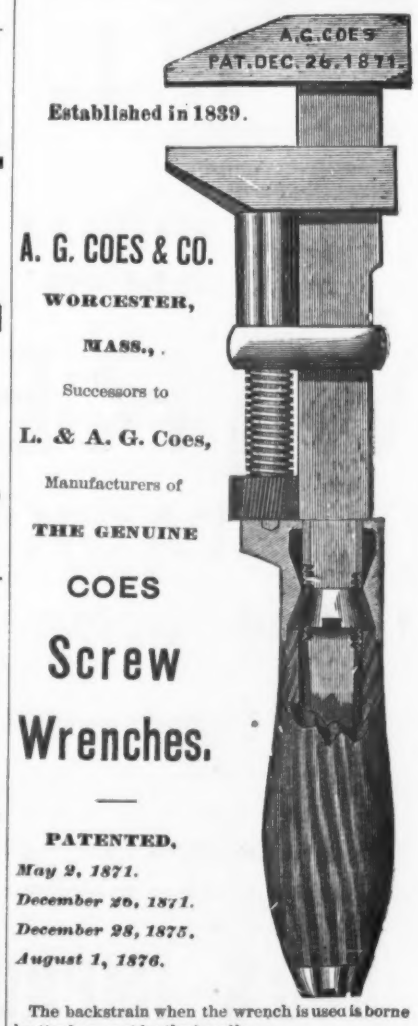

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III.—EXPERIMENTS MADE ON ROLLED "OPEN HEARTH" STEEL PLATES.

Mark.	Carbon per-centage.	Dimensions.	Tensile stress in pounds per sq. in. in direction of rolling at— Elastic limit.		Rupture.		Per cent. elongation.—Average.	Remarks.
P.1	0.30	⅜ in. × 12 in. × 6 ft. long, tested as they came from rolls; crop ends sheared; 50 in. between jaws of machine.	43,260	44,380	79,120	78,320	19.3	Fractures fine and silky.
P.2	0.30		44,820		77,840			
P.3	0.30		45,110		78,190			
P.4	0.30		43,990		77,970			
P.5	0.30		44,720		78,280			
R.1	0.40		51,620	51,170	81,990	82,480	13.9	Fractures very fine, less reduction of area.
R.2	0.40		50,980		81,720			
R.3	0.40		51,260		83,730			
R.4	0.40		51,100		81,830			
R.5	0.40		50,810		83,130			
V.1	0.50		58,950	58,960	85,790	85,980	10.5	Fractures good; slightly granular on edges.
V.2	0.50		59,200		86,220			
V.3	0.50		58,540		85,560			
V.4	0.50		58,880		86,000			
V.5	0.50		59,330		86,330			

TABLE IV.

Carbon.—Per cent.	Dimensions of Rolled Steel Plate.	Dimensions of Specimen therefrom.	Ratio of Thickness to width in Test Pieces.	Number of Specimens. Cut in Planer. In direction of Rolling	Cut in Planer. Across.	Sheared. In direction of Rolling	Sheared. Across.	Punched. In direction of Rolling	Punched. Across.
0.30	¼ in. thick by 18 in. wide	¼x1½x18 in.	50 %	3*	3	3	3	3	3
0.40	⅜ in. thick by 15 in. wide	⅜x1¼x15 in.	33 %	3	3	3	3	3	3
0.50	3-16 in. thick by 12 in wide	3-16x1x12 in.	18 %	3	3	3	3	3	3

* Each group of three specimens was obtained by taking one piece from each end of the plate and one from the middle.

V.—AVERAGE RESISTANCE OF O. H. STEEL PLATES TO TENSILE STRESS IN POUNDS PER SQUARE INCH OF SECTION.

Carbon.—Per cent.	Lengthwise. Elastic limit.	Ultimate.	Elongati'n. Per cent.	Crosswise. Elastic limit.	Ultimate.	Elongati'n. Per cent.
0.30	49,353	93,339	16	49,510	95,453	18
0.40	63,227	86,410	14	63,723	87,780	16
0.50	65,070	83,190	10	65,300	84,995	15

VI.—COMPARATIVE RESULTS OF THE EFFECTS OF SHEARING, PUNCHING, ANNEALING AND TEMPERING STEEL PLATE.

Carbon.—Per cent.	Treatment of specimen.	Average resistance of O. H. steel plates to tensile stress per square inch of section. Elastic limit. Lbs.	Difference. Per ct.	Ultimate. Lbs.	Difference. Per ct.	Elongation. Per cent.
0.30	Cut in planer	49,431	.....	94,396	.....	17.
0.30	Sheared	32,370	— 35	74,900	— 20	10.
0.30	Punched	0.0	— 100	63,410	— 33	0.45
0.30	*Punched and hammered cold	0.0	— 100	87,540	— 8	0.55
0.30	*Punched, hammered and annealed	55,780	+ 12	100,410	+ 6	7.5
0.40	Cut in planer	63,475	.....	87,095	.....	15.
0.40	Sheared	46,960	— 28	75,330	— 14	7.
0.40	Punched	0.0	— 100	68,890	— 20	5.
0.40	Sheared and annealed	59,350	— 7	86,160	— 1	16.
0.40	Punched and tempered	52,780	— 17	103,560	+ 19	7.
0.50	Cut in planer	65,185	.....	84,092	.....	12.5
0.50	Sheared	51,666	— 20	79,900	— 6	5.
0.50	Punched	0.0	— 100	78,400	— 7	4.
0.50	Sheared and tempered	60,375	— 8	87,293	+ 4	17.
0.50	Punched and annealed	57,960	— 10	84,920	0.0	12.

*These two results are not averages, but were obtained from single tests.

VII.—EXPERIMENTS ON O. H. STEEL PLATES WITH DRILLED, PUNCHED AND REAMED, PUNCHED AND ANNEALED, AND COLD PUNCHED HOLES.

Carbon. Per cent.	Description of Plate specimen.	Hole.	Av. ult. tens. str. in lbs. per sq. in. of effective service.	Per cent. Elorgation of hole.
0.30	¾-inch rolled plate, cut in planer on all edges. Strips, 2½ inches wide, 18 inches long.	Drilled, 1-in. diameter	98,466	22.
0.30		Punched, 0.935-in. diam. Reamed to 1.1-in. diam.	100,700	20.
0.30		Punched and annealed, 0.935-in. dia.	78,970	21.
0.30		Punched, 0.935-in. diam.	66,168	3.3
0.40	⅝-inch rolled plate, cut as above. Strips, 1¼ inches wide, 15 inches long.	Drilled, 0.6-in. diameter	99,747	15.6
0.40		Punched, 0.5-in. Reamed to 0.62-in. diam.	104,253	19.
0.40		Punched and annealed, 0.62-in dia.	87,910	18.9
0.40		Punched, 0.62-in. diameter.	80,550	5.
0.50	3-16-inch rolled plate, cut as above. Strips, 1-inch wide, 12 inches long.	Drilled, 0.4-in. diameter	86,903	29.
0.50		Punched, 0.4-in. Reamed to 0.5-in. diam.	89,043	26.
0.50		Punched and annealed, 0.45-in. dia.	84,951	31.
0.50		Punched, 0.45-in diameter.	82,330	15.

The British Iron Trade.

The London *Times*, in its issue of April 14th, comments as follows on the condition and prospects of the British Iron Trade:

Those who are concerned in the production and consumption of iron are not a little perplexed by the downward tendency of prices, and by the slackening of the American demand, which was confidently expected to keep up at least throughout the whole of the present year. The outlook, indeed, is full of uncertainty, and naturally enough much anxiety is manifested to gauge it aright, and so anticipate the requirements of the future. The revival of industry on this side of the Atlantic has been largely due to the demands from the other side, and it is believed in many well-informed quarters that those demands will not materially decline for at least six or eight months to come. But the latest aspects presented by the American market are by no means reassuring to English industrials. The official organ of the American Iron and Steel Association, in a recent issue, set forth that after the 1st of the present month America would be "equal to supplying her own demands in all lines;" that "in bars, plates, sheets, hoops, nails, agricultural and other steel, and pig iron the demand from all sources is practically already met;" and that many furnaces that were idle during the period of depression have already been got to work, while others are preparing to follow. The most that the Americans lead us to expect is that they may during the present year take from us about 100,000 tons of railway iron, toward completing the 1,500,000 tons which they reckon on using in the renewal of their existing railway system of 83,000 miles, and in laying about 7000 miles of new track. This, however, would only be a drop in the bucket compared with the consumption for which the iron and steel manufacturers of this country are preparing and hoping.

The unemployed resources for the production of iron brought into operation within the last six months, are probably greater than have ever before been called into use within a similarly short period. In America the number of furnaces blown in between July and December last is ascertained by *The Iron Age* to have been 127, bringing up the total number in use to 384, or a larger number than was found working at any time during the preceding seven years. These 384 furnaces are equal to producing 4,250,000 tons of pig iron per annum, which is nearly 1,500,000 tons more than America has yet produced in any one year. But this is by no means the maximum production of which America is capable, for 293 furnaces were out of blast at the same time that these 384 were in operation, so that a formidable reserve is still available. When we add that America has never yet consumed much over 3,000,000 tons of pig iron in any one year, it will at once appear that her present ratio of production is likely to be fully abreast of all her own requirements. It is true that during the last three months the United States have taken a great deal of pig iron from England, but much of that iron was intended to meet a demand that was more speculative than *bonâ fide*, and this to some extent accounts for the depreciation of value recently witnessed.

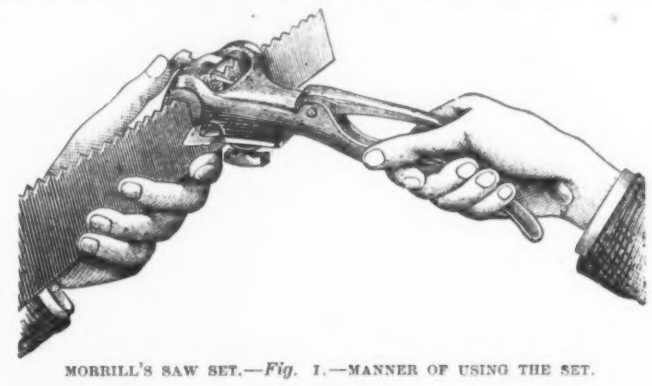
Statistics collected within the last fortnight show that in the United Kingdom 141 furnaces have been blown in since the 1st of November. Of that number 97 are in England, 22 in Scotland and 17 in Wales. These

141 furnaces are equal to producing 2,099,600 tons of pig iron per annum—a quantity exceeding the whole annual production of France, and almost equal to that of Germany. Cleveland alone is now turning out pig iron at the rate of 2,270,800 tons a year, equal to an increase of more than 250,000 tons on the production of 1879. When we add the increased ratio of production in England and America together, we find that they aggregate about 3,500,000 tons. No such increase as this has ever before occurred. It is calculated that between 1871 and 1872 the production of pig iron throughout the world increased from 12,565,000 to 14,445,000 tons, but of this increase Great Britain only contributed 114,000 tons, and the United States 740,000 tons, the remainder having been supplied by Germany, Luxembourg, Belgium, France, &c. All of these countries, as well as our own, have now been stimulated by the prospect of remunerative prices to develop their production, and, although there are not available for them, the same exact figures as those quoted for the United States and England, it is sufficiently well known that the increased resources brought into operation have been very considerable. Bearing all this in mind, it need excite no surprise if the decline that has recently taken place in the price of iron should not only continue, but proceed in an accelerated ratio. Should the present rate of production be maintained, it is difficult to understand where a market is to be found for so much iron. The analogy of past experience does not guide us to a satisfactory conclusion on this question, because the high prices of 1871–72 induced several countries that were formerly among our best customers to increase very largely their means of production. English enterprise, of course, is constantly seeking for and opening out fresh markets; but even if these markets should fully repair the deficiencies of demand in the case of older customers, and thus prevent any absolute decline of our production, it is not to be expected that they will call for the enormous balance now being created in favor of supply. Overproduction, in short, is again threatened. Such a result was almost inevitable from the large producing plant inoperative when the revival set in, and from the suddenness with which prices were increased. Of the 950 furnaces erected in Great Britain, only 458 were in operation during October last, so that 492 furnaces were unproductive. Ironmasters had great, and perhaps irresistible, inducements to call this costly and idle plant into activity when they saw hematite iron increase 150 per cent., Scotch pig iron 70 per cent., Cleveland iron 61½ per cent. and Lincolnshire iron 76½ per cent. within three months. That these advances have not been maintained is, of course, due to the fact that more and more iron has been thrown upon the market, until something almost approaching a glut has been produced. At the present time, however, manufacturers have little reason to complain. They will not suffer much hurt if prices do not fall below their current level, and they will have reason to congratulate themselves if the state of trade continues such as to enable that level to be maintained.

Extinguishing Fires with Steam.

Mr. Joseph Bird, who has given a great deal of attention to the subject of extinguishing fires, has recently written an article to the *Fireman's Journal* on the subject of using steam for this purpose. The success of this method, it seems, has been very marked, and it promises to be of great value in the future. Mr. Bird says:

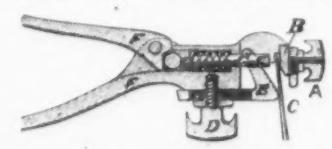
It is very singular that this improvement has not been made in steam fire engines. That a building on fire, but which has not burned "out" to the air, can be, if not too large, instantly extinguished by steam, and with one-tenth of the loss, especially if filled with merchandise, than it can be by water, is true beyond a doubt. Many of our great warehouses are so large that no one, or perhaps two, steamers could fill them, and thus they would not be saved in this manner, unless brick or iron walls are thrown across the buildings, as is the custom in Liverpool and London. I propose to describe the way the engines would be worked when this steam arrangement will be made, and the steamers altered so as to throw steam as well as water. On arriving at a building on fire, the men would instantly perceive whether water or steam should be used; if water, the arrangement for work would go on as at present. If the fire was confined within the building, the steam-pipe would be got ready, while one man, with the proper-sized auger, bored a hole for the steam-pipe into some door or window near the fire. That is all. Water or steam. Now one, then the other; and the property of the city vastly better protected by it, and at a very slight expense. Steam has often been tried at different times; and as it has been tried under difficulties, it has often failed. These failures were sure to have the widest circulation, while success has often been kept out of sight. All buildings in which steam is used should be prepared so as to extinguish their own fires, which would save a great amount of property to the owners, and often to others. Persons owning such buildings and wishing to prepare them, may learn how simple the manner is by calling to see the kerosene works of the Downer Company, at South Boston. Of course such works, under the most careful direction, often take fire. If a fire occurs there, in a minute the doors are shut and steam turned into the building from the outside. In from one to three minutes that portion of the building is crowded with steam and the fire is out, when at its leisure the steam is allowed to escape, and the men go to their work again. One of the neighboring business men took quite an interest in this new way of getting rid of the dangerous element, and as the steam smothered out one fire after another, he became so excited as almost to wish that the fire would for once come off the conqueror. Hearing one day an unusual noise in that direction, he looked up and saw one of the buildings wholly enveloped in flames. "There!" said he, "now they will catch it!" and off he went, pell-mell, to get around to the front and witness the destruction. On his way he had to run a few rods out of sight of the fire. His last look showed no diminution of the flames; but when, after a run of ten rods, he came in full view, the steam had been turned on, and, to his unbounded astonishment, not the slightest sign of fire could be seen! It would be very easy to bring about this much-needed change, as when application was made for using steam power in a proper place, it could be granted on condition that the parties should introduce steam pipes for extinguishing fires. These would soon prove so efficient for that purpose, that all persons owning buildings using steam would find it for their interest to also introduce such pipes. There need be no fear that there will be too many ways to get rid of fires. It is because we have had but one string to our bow, and that sometimes lost for 15 or 20 minutes, that we have so many great fires.



MORRILL'S SAW SET.—*Fig.* 1.—MANNER OF USING THE SET.

Morrill's Saw Set.

The accompanying illustrations represent a little tool quite recently put upon the market, which, we judge, has more than usual interest for our readers. It is a saw set, working upon principles radically different from those in common use. Fig. 1 shows the manner of using the set, while Fig. 2 shows the construction and operation of the parts. It will be seen that, in its general features, the set resembles a large pair of pliers, save that the handle, instead of operating a jaw, as in pliers, works a punch. The blade of the saw is passed in front of the punch, as shown at C in Fig. 2. By depressing the lever, or handle, F, the punch is driven forward, striking the tooth of the saw, as indicated at B, thus imparting to it whatever set is desired. The amount of set is regulated by the movable guard E, which is held in place wherever it is required by the screw D. The die B is regulated by the screw A in the forward end of the set, in such a manner as to control the angle upon the die. By this means the tool is adapted to use both with fine and coarse saws. It



MORRILL'S SAW SET—*Fig.* 2.—CONSTRUCTION OF THE TOOL.

is claimed by the manufacturer, Mr. Asa Farr, whose office is at No. 136 Chambers street, New York, that this set has been tested, and is in constant use by more than 1000 leading mechanics in this city and vicinity. The inventor offers this tool as the result of over 30 years' practical experience in the use of saws and saw sets. He contends, with great reason, that there is no saw which does not require setting, however scientifically it may be made. Saws, by constant use, wear on the side of the teeth at the points, thus causing friction, which is only overcome by frequent filing. This consumes time and files and causes a constant wear on the saw, producing the liability of rucking. He claims that with the proper use of the set represented in the accompanying engravings, saws need not be filed more than once where they are ordinarily filed three times. Saw teeth should be set or pressed into line wherever they bind, and this set corrects the faults of too much set in places, and also imparts a uniform set to new saws. By giving careful attention to the matter of set, &c., the mechanic is able to do his work better, with more ease, and with greater rapidity than otherwise. Besides this there is a saving of files, and a reduction in the wear and tear of his saw. The set as manufactured is adapted to all kinds of saws in general use, including band and scroll saws, and, as will be readily seen by examining the illustrations, can be made to operate with the accuracy and precision of a die. The opening at the top permits the operator to observe the action of the punch on each tooth, and to determine when the tool is in correct position.

A series of fires have destroyed a large number of wells, oil tanks, dwellings, &c., at Rew City, Bordem, Coleville, near Gillmore, Duke Center and other localities in the Bradford oil region. There were probably three fires at least of independent origin. The loss is said to be very heavy

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AND

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CONTENTS.

A Pittsburgh paper facetiously remarks concerning the attempt of last year to agree upon a sliding scale for coal mining in that vicinity, that "If the operators had signed "the sliding scale based on the price of iron, "which the miners so persistently advo- "cated at one time, the price of digging "would now be two and one-half cents, in- "stead of three cents. That's why the "miners smile." An answer to this would remind one of the celebrated "kettle case" in which the counsel for the defendant proposed to prove three points: 1. That his client never had the plaintiff's kettle. 2. When he borrowed it it was broken. 3. When he returned it it was whole. In the first place the operators were never asked to sign a sliding scale based on the price of iron, therefore the price of digging would not be two and one-half cents, and the price of digging is not now three cents. What the coal diggers did demand was a scale based on the price of boiling iron in the Pittsburgh mills. The manufacturers offered a scale based on the price of iron, but it was refused, and on this scale, the only one offered based on the price of iron, the price for digging would be below two and one-half cents.

The British Iron Outlook.

Those connected with the iron trades of England find it difficult to realize that the conditions which, for a brief time, favored a large exportation of iron and steel to this country, have so changed that the fact of losing the newly-recovered American trade altogether must now be accepted as a certainty. We are not surprised at this, for so many bright hopes have been based on the continuance of the demand from this country, that those who will suffer from their disappointment will not be likely to concede that the American demand is over until shipments shall have ceased. As we have more than once pointed out, statistics showed that there was little outside of the American demand on which to base the hopes of increased activity and better prices in the English iron trades, but men generally expect what they hope for, and to this fact we may attribute the confident tone of most of the predictions regarding the future of the iron trades which have been given currency in the English prints. There was a chance that the Liberal victories in England would inspire confidence and that a general business revival would follow; but this does not seem to have happened as yet, and probably will not from this cause.

The importance of the American markets to the iron and steel industries of Great Britain are probably better understood in that country than in this, because the statistics of the British export movement are better known and understood there than here.

The exports of iron, steel and tin plates from Great Britain from 1870 to 1873, and 1878 and 1879 are shown as follows in the Board of Trade returns:

Year. of Export.	To the United States. Tons.	To other countries. Tons.	Total. Tons.
1870.....	805,139	2,020,436	2,825,575
1871.....	1,036,829	2,132,390	3,169,219
1872.....	560,615	2,422,147	3,382,762
1873.....	456,755	2,502,559	2,959,314
1878.....	157,418	2,130,442	2,296,860
1879.....	707,427	2,172,457	2,879,884

To complete the showing, we give a table of the exports of iron, steel and tin plates from Great Britain during the first quarter of 1880, as compared with those for the first quarters of 1879 and 1878:

Nature of iron.	To United States.		To all other countries.		
	1878.	1879.	1878.	1879.	1880.
	Tons.	Tons.	Tons.	Tons.	Tons.
Pig.....	5,341	9,702	159,531	197,784	167,666
Bar, angle, bolt and rod..	1,626	715	23,687	40,125	63,179
Railroad of all sorts.....	109	1,184	43,367	109,648	86,044
Hoops, sheets and plates.	156	235	14,421	41,979	37,028
Tin plates.....	44,739	32,933	43,071	10,523	10,123
Cast or wrought.....	548	1,796	2,231	59,045	59,516
Old for remanufacture....	369	1,601	99,368	3,584	5,395
Steel unwrought.....	1,187	1,412	11,125	4,080	4,391
Total three months....	33,675	49,690	408,867	436,775	438,829
					449,413

The indications now are that for the remainder of 1880 the exports to this country will fall below those for the last nine months of 1878. The question of greatest and most immediate interest for the trade is: Can a demand from other countries be counted on which will enable the trade to lose the American market again without a collapse in prices and a total stagnation due to a heavy overproduction? A candid answer to this question precludes a hopeful view of the immediate future, at least. Such countries as Germany, Belgium and Luxembourg, which were good customers for British iron in 1872 and 1873, have since become large producers through the development of their own industries, and may be considered rather as competitors than consumers. We hear a great deal about the expected demand from Germany and Russia, but a comparison of the exports of British iron and steel to those countries in 1873 and 1879, furnished to the London *Times* by a correspondent, makes a discouraging showing:

	—To Germany.—		—To Russia.—	
Bar, angle and bolt..	1873. 26,830	1879. 5,225	1873. Not shown for 1873	1879. 38,487
Railroad.....	42,984	3,500	162,275	
Hoop, sheet & plate.....	26,023	8,074	17,965	11,919
Cast or wro't and manufacturing...	28,183	8,855	42,880	8,697
Totals . ..123,040		25,654	223,120	59,103

Looking over the whole situation, we fail to find therein any encouragement for even a moderate and sustained prosperity for the British iron trade. The productive capacity of Great Britain so far exceeds the present requirements of her own and the foreign markets depending upon her, that we see no reason why the conditions there should not for a long time to come be much the same as those which existed here between 1874 and 1878. There can be no substantial recovery there without a larger export demand than is now in sight, and when the stimulus of the abnormal and largely fictitious American demand is withdrawn, but little seems to remain on which to base confident predictions of the future.

On the other hand, English iron masters have been noting with alarm the determined and well-directed efforts of Belgium and Germany to gain a foothold in markets which have hitherto been supplied from England exclusively. The makers of certain specialities in both countries were not slow to argue that if they could sell some of their goods in England, they would find it easier still to invade England's markets in South America and Australia. Hitherto this danger has been confined to certain classes of rolled iron, but a more formidable competitor is now looming up in the shape of cheap steel. There is probably no district in the world so much favored, as regards the production of cheap pig, as that of Belgium, Louxembourg, Alsace and Lorraine, dependent upon the Minette deposits. There is every reason to believe that the Thomas process has made this abundant supply of cheap metal available for steel, and the energy with which such firms as the De Wendels, Schneider and others are entering this new field, plainly indicates how much is expected and proves that much will be done. A strong competition is thus rapidly organizing which will fully tax the powers of English producers.

On another page we print a carefully considered editorial article from the London *Times*, which shows that overproduction is again threatened. The advance of 150 per cent. in hematite iron, 70 per cent. in Scotch pig, 76½ per cent. in Lincolnshire iron and 61¼ per cent. in Cleveland iron, furnished an irresistible temptation to blow in a greater number of furnaces than are now needed to supply the demand, and it is largely due to this fact that the advances have not been maintained. We scarcely see any direction in which even British enterprise can push for new markets which will be large or important enough to compensate for the loss of those older markets that have hitherto been depended upon. "Hostile foreign "tariff legislation" has seriously crippled the manufacturing industries of Great Britain, but generally it has helped the countries which have adopted such tariffs, and the dream of universal free trade is less likely to be realized now than ever before.

The Decline in Tin.

Since we last had occasion to write upon the subject of the tin position, on Feb. 26, the latter has become worse from week to week. Straits tin recovered in this market in January from 21 to 25 cents; it remained tolerably steady in February between 23¼ and 24⅝ cents; in March it declined from 22⅜ to 21¼ cents, and in April from 21 to 18 cents; there has, consequently, been a depreciation of 28 per cent. since January. Other metals, it is true, have also declined; the reaction in tin has, therefore, partially been brought about by general causes, but there must have been special causes besides, and it is not difficult to point them out.

The weakest point in the position of tin has been repeatedly shown since October last in these columns, namely, the extravagant notions that had been set afloat, and maintained up to quite recently, with respect to the American ability of absorbing this metal. It was insisted upon that, with our population of 45,000,000 inhabitants, we were actually consuming 14,000 tons of tin (although non-producers of tin plates to any appreciable amount), while Europe, with 325,000,000 inhabitants and an enormous tin-plate production, supplying not only Europe, but ourselves and the rest of the world with them, was put down for a tin consumption of 20,000 tons. It was insisted upon that for solder alone our consumption had increased enormously, and statistics were drawn up to prove this anomaly of America consuming so much more tin than other countries; but the course of tin prices in the United States would have been very different in March and April if all the deliveries said to have been made to consumers had really been got out of the way, instead of still being to a considerable extent the property of speculative importers and dealers. The downward course of prices has no doubt been precipitated latterly by the more corect views now prevailing with reference to our *bona fide* consumption.

The shipments from the Straits alone this way thus far in 1880 have been simply extravagant, for they sum up no less than 3700 tons for the first four months, or at the rate of about 11,000 tons per annum. If they kept on at the same rate, as well as those from other sources of supply, we should, indeed, receive this year the full measure of 14,000 tons, and even more. It is, however, not likely that the tin shipments this way will go on at the same rate. From the Straits they have begun to decrease materially, and from other quarters they will not unlikely be suspended during the summer months, so as to give the American market a little breathing time. To England, shipments from the Straits have stopped altogether. After a while the statistical position in Europe will improve, and tin may steady in value, instead of wildly fluctuating as it has lately done.

On March 1 the visible supply here was 8500 tons, sufficient to last us till fall, even if not another pound were ordered in the meantime, and calculating our consumption at the extreme rate at which it has been set down by interested parties. Instead of decreasing, the visible supply here has since increased; there will, consequently, not only be tin enough for all our purposes until fall, but we shall, in all likelihood, have some left to spare for re-export should the position in Europe improve sufficiently to hold out inducements for doing so. The statistical position in Europe was as follows at last advices:

	1880. March 1. Tons.	1880. April 1. Tons.	1879. April 1. Tons.	1878. April 1. Tons.
Foreign tin in London.....	8,284	8,251	10,079	8,848
Banca tin in Holland.....	1,384	1,564	2,051	1,571
Banca tin (in company's hands)...	1,210	888	432	204
Billiton tin in Holland.....	1,696	1,692	2,048	1,647
Total.....	12,574	12,395	14,530	12,270
Quan. of tin afloat for Europe.....	2,700	2,400	4,500	4,000
Quotations on the same dates, being for Straits, per ton.....	£93	£86	£68	£63.10/

With lighter shipments to Europe and fair deliveries there, the position as it stands is susceptible of a prompt and material amelioration—a thing very much to be hoped for, the more so as we have shown that the elements of improvement are not apparent on this side, unless, as we have said, shipments this way are altogether arrested for a long time. Production, so far as has been ascertained from reliable sources, proceeds normally in the East. Foreign tin consumption in China may, however, be interfered with at any moment should that country become involved in a war with Russia, which has been threatening for about a month past, and China takes, on an average, about 6000 tons of Straits tin annually. A stoppage of Chinese tin purchases at Penang and Singapore would, while it lasted, undoubtedly make a material difference. The first warlike manifestation on the part of Russia would be to hermetically seal up the Chinese ports, thus putting a stop to all maritime intercourse of the Celestials. The Chinese, not content with getting into difficulties with Russia, have assumed an equally hostile attitude against Portugal about Macao, all due to the anti-foreign party now ruling the destinies of the country at Pekin.

We dwell on these contingencies merely to show that the immediate future of tin, even at the lower price now established, is beset with a great many uncertainties, and that there is every reason to exercise the utmost caution, uninfluenced by the wild arguments of speculators anxious to shift their load upon the shoulders of the legitimate metal trade.

The Coke Trade.

The fluctuations in the price of coke have been the largest and most marked of those in any of the branches of the iron and coal trades. About a year ago the ruling price of Connellsville coke was 90 cents per net ton, f. o. b. cars at the ovens. In many instances even this low rate was not obtained, and contracts were made as low as 85 cents. This rate will be better understood when it is remembered that coal loses in coking about one-third of its weight, so that a ton (2000 pounds) of coke would represent, say, one and one-half net tons of coal, and 90 cents for coke would be 60 cents a ton for the coal, without counting the labor of coking, drawing and loading. From this low rate of 90 cents a ton, under the stimulus of the increased demand both East and West, coke advanced to $5 a ton, an advance of over 450 per cent. This advance not only stimulated the production of the ovens already in existence, but led to the building of a large number of new ones. A year ago the number of ovens in the Connellsville region was something over 3000. An article published in *The Iron Age* of January 16, 1879, gave the number of ovens at that time as 3668, but this included what may be called the Connellsville, Pittsburgh and Pennsylvania Railroad districts. Since that time fully 2500 ovens have been built or are in course of construction in the Connellsville district. Similar conditions exist in the other districts. In the New River district of West Virginia, the ovens that have been built within a year, or that are now under construction, will more than double the capacity of that region. New ovens have been erected or are building in the Pittsburgh, Blassburgh and Low Grade districts of Pennsylvania, at various points on the Ohio, in Alabama, in the Illinois coal field, in Colorado and at other points. Old ovens that for various reasons have been idle have resumed, and it would not be much of an overestimate to say that the capacity of the county for the manufacture of coke will be at least double what the make was a year ago when the ovens now building are completed.

Under the influence of this large increase in capital, combined with the use of some anthracte at a number of coke furnaces and the reduction in the price of pig iron, Coke has declined very rapidly in the past two months. As we write, $2.50 is probably the extreme price.

What the future of Connellsville coke will be it is difficult to foretell. Coke is the typical blast furnace fuel. The wonderful runs of furnaces using coke prove this; the large increase of production of anthracite furnaces working part coke confirms it, and the relative consumption of coke promises, whatever may be the condition of the iron trade, to be greater than ever before. Heretofore, Connellsville Coke has been regarded as the coke *par excellence*. Other districts are beginning to dispute this claim, and in some cases with good reasons. Makers in these districts are wise; they do not claim a superiority, but an equality, and in some cases can substantiate the claim. The facilities of the Connellsville region and the well known uniform, good quality of the product of most, if not all, of the works, will enable it to keep its pre-eminence for a long time to come, and perhaps will keep coke from falling to the ruinously low rate of a year ago.

Private Brands of Tin Plate.

In our issue for April 15th we quoted from the *Ironmonger*—an English hardware journal—some editorial comments on the subject of private brands of tin plates and a letter addressed to it by a Welsh manufacturer. We also expressed our own opinion of the features of trade involved in this private brand business. In very plain terms we characterized as fraudulent any scheme which obtains the price of a good article for one of inferior quality by a simple change of name. It is nothing less than obtaining money by false representations. That transactions of this kind have become so common as to be considered quite respectable, is no excuse for them whatever.

The letters which have poured in upon us concerning this matter only indicate how widespread is the interest in it. While the communications received are for the most part of a private nature and not intended for publication, we cannot forbear one or two quotations. A house well known in the tin and metal trade writes: "It is our personal "opinion, substantiated by the jobbers and "consumers in general with whom we have "had occasion to talk upon the subject, that "no more instructive article to the tin "trade has been published." The same letter continues: "By sifting out this system "of private brands and opening the eyes of "the people to just what they are buying, "you are putting commercial interests upon "a firm basis. While thousands are being "benefited, some few who have been work- "ing this system of private brands in their "own interests may cringe under exposure, "but others who have always deprecated "the practice can fully appreciate your en- "deavors. We look forward with interest "to other articles upon the same subject."

Besides the attention which this article has attracted among our readers, it has been extensively quoted by the trade papers, all of which agree with *The Iron Age* in the position it has taken. The *Industrial World*, published in Chicago, under date of April 22d, says: "Efforts have been made "here, and are still being made, to induce "the retail trade and consumers to order "well-known makers' brands, but there are "difficulties in the way which have pre- "vented the accomplishment of this end. "There are from eighty to ninety different "manufacturers of tin plates, each of whom "make from ten to twenty qualities. Their "standard grades are not uniform, and fre- "quently the quality of each maker varies "somewhat." Further on in the same article, and referring to the above statement, it continues: "This, it seems to us, is not an "insuperable objection, because the trade, "after acquiring a knowledge of several "standard grades, would have a reasonable "certainty in ordering them, as the inter- "ests of the manufacturer would be to "maintain the quality of his goods, whereas "the dealer who maintains his own brand "may not be so careful in the selection, or "the manufacturer who puts them up for "him may be equally regardless of main- "taining a good reputation for the trade." The same paper, in another place, says: "The parties who are the principal sufferers "by the sale of private brands are the man- "ufacturers and purchasers of tinware, and "those for whose actual use tin plate is "made. Thus the housewife who finds her "tinware giving out under light usage, and "the householder who finds his tin roof "leaking, and whoever employs tin plate in "actual use, are the sufferers. The maker "of tinware is a loser by purchasing infe- "rior qualities, because it requires greater "labor and more expenditure of time to "make up cheaper tin, and also because the "reputation of his work suffers by using "it."

From copies of the *Ironmonger* for April 3d and 10th, subsequently received, it would seem that the discussion is by no means ended on the other side. In the former of these papers is published a second letter from "One Who Knows the Trade," respecting statements made by a correspondent who had replied to his former letter, and which we quoted in our issue of April 10th. This correspondent, in the letter before us, presents a system of classification adapted to the use of manufacturers and jobbers, in which the following grades appear: First grade, second grade, third grade and fourth grade of charcoal; the same divisions of best cokes and also the same of common cokes. He then says: "So far as "the private brand is concerned, it has no "place among classified brands. It is as "erratic as a will-o'-the-wisp. It may be "equal to the first grade of charcoal to-day, "and be inferior to the fourth grade to- "morrow. The owner thereof carries it "about like the paint pot and stencil plate "of the bailiff, and when he finds it has

"fallen into dislike among the consumers, "he flings it into the limbo it should never "have come from and adopts another."

Another correspondent of the *Ironmonger*, whose letter appears in the issue of the 10th, makes the astounding statement that there are more than 1500 private brands in common use at the present time. Private brands in use in this country are undoubtedly far less numerous than this statement would indicate, but still there are enough of them to make the trade a blind one for whoever has purchases to make. The *Ironmonger*, in its editorial comments upon the latter letter, says: "The more thoroughly "the intricate and involved question of "private brands of tin plates is examined "and investigated, the greater appears to "be its importance. For several weeks "past our correspondence columns have "contained letters bearing upon this subject, "and we think we may venture the assertion "that not one of them has been penned in "vain, but rather that each writer has done "something toward placing the matter on a "better and fairer footing. That there are "still many points involved in obscurity is "clear, but we hope to have these laid bare as "we go on, and to so place the branding ques-"tion before our readers as to leave no room "in the future for doubt or the 'opacity of "dishonesty.'"

We shall use every endeavor to keep our readers thoroughly informed upon the discussion of this subject. Its importance cannot be overrated. It is one which underlies the very foundation of one of the most important trades in this country. Private brands are an abuse which has grown up and been tolerated by men who would not stoop to ordinary forms of dishonesty. The time has come when the practice must be rooted out and thoroughly exterminated.

The blame does not lie entirely with manufacturers, importers and wholesale dealers. The desire for goods at still cheaper and cheaper prices expressed by those who buy tin plates for use, was the original temptation which led respectable merchants into the position in which they now find themselves. Accordingly, reform, by right, should commence with the small dealers, as well as among wholesalers. Let every dealer from this time forth, in ordering tin plate, order exclusively well-known makers' brands and discriminate against private brands. Give the supply houses every possible encouragement to deal in honest goods. Thus shall a genuine reform be commenced which, like a little leaven, shall leaven the whole lump.

The Sliding Scale in Iron Mills.

The heavy reductions in labor in the West consequent upon the action of the sliding scales, bring into prominence one of the evil effects of such scales. If they increase wages, they decrease them just as rapidly. It is doubtless very pleasant to have boiling jump from $5 to $7.25 in a few months, but it is not nearly so pleasant to have it decline to $5 again in so short a time. The violent fluctuations of the past year are exceptional, of course; but the very fact that sliding scales exist which raise and lower wages, is an argument against a rapid advance and in favor of bringing the card down at once to the selling price; and so long as these scales remain in force it must be expected that manufacturers will not long keep the card above the quotations of the open market. Of course, while this is an argument against such scales, there are many others in favor of them, and there is no doubt that sliding scales on a proper basis and with a reasonable percentage of advance, are of great value to both employers and employed. The objections will lie mainly against scales in which the basis is too high and the percentage of advance too great. For comparison we give below the prices which the scales in effect at Pittsburgh call for on the 2½ and 4-cent cards. With the exception of the guide mill scales, no provision is made for a price when the card is below 2½ cents:

The price for	2½ cent card. Perton.	4 cent card. Perton.
Boiling	$5.00	$7.25
Busheling on cinder	2.50	3.62½
Scrapping piles on boards	2.00	2.60
Knobbling scrap	4.70	6.12
Knobbling refined iron	6.11	7.85
Knobbling pig	7.52	9.86
Muck rolling	.62½	.90⅝
Bar heating	.65	.97
Bar rolling	.65	.97
Nail plate heating	.65	.97
Nail plate rolling	.55	.87
Guide rolling	*40 %	*10 %
Shingling muck	.75	1.01
Shingling charcoal iron	.82½	1.11
Heating and shingling slabs and doubling	.75	1.10
Steel rolling	*20 %	†10 %
Plate rolling, No. 9 and heavier	.80	1.17

* Off list. † Added to list.

In connection with the returns of blast furnaces, which we have published quarterly for some years past, we have several times remarked the greater readiness of the coke furnaces of the country to accomodate themselves to changes in the market. After the panic of 1873 these furnaces went out of blast more readily than the anthracite furnaces; the production of coke irons was reduced more rapidly than that of anthracite, and it took several years for the proportion of anthracite furnaces in blast to those out of blast to reach the figures shown in the statistics of the bituminous furnaces. The present reaction in iron shows this still more clearly. The coke furnaces are accomodating themselves to the light demand and are blowing out. We have reports of sixteen furnaces out of blast in the immediate vicinity of Pittsburgh, and our list is undoubtedly imperfect. The capacity of these furnaces and their actual make, under ordinary conditions, is about 6000 tons. If the present condition of the iron market continues, others will blow out.

The radical action of the Western Iron Association, at its meeting on the 5th inst., in reducing the card from 3.2 to 2½ cents, has already been noted in our trade report of last week. The reason for this reduction seems to have been that the previous reduction from 4 to 3.2 cents was not sufficient to stimulate trade and to meet the prices made by speculators and jobbers. There was also a belief abroad among buyers that 3.2 cents was not the lowest point. In fact, iron was being offered below 3.2 cents, and the 2½-cent card was necessary to get down to where it was being offered. The effect of the reduction has not yet been made manifest. The mills in the West that have been idle do not seem anxious to start up; blast furnaces are going out of blast, and as yet the reduction seems to have failed to stimulate trade to any extent. The fluctuations in the iron card from the lowest point reached during the panic are as follows:

April 4, 1877	$1.75
April 18, 1877	2 00
August 28, 1879	2.50
September 29, 1879	3.00
January 5, 1880	3.50
February 2, 1880	4.00
April 8, 1880	3.20
May 10, 1880	2.50

The flint and lime glass manufacturers of the country have decided to hold a meeting in Philadelphia on the 19th inst. It is understood that the question of labor will be chiefly discussed, in the hope that an understanding can be arrived at which will make strikes less formidable. Other topics for consideration will be the best modes of sustaining prices and keeping production within the limit of the legitimate requirements of trade. Trade meetings of this kind, if called with a proper object in view, are of benefit to any industry. They lead to better understanding between competing firms and sections, and promote a harmony of action which is always favorable to stability of values and a judicious regulation of production.

The three tariff bills reported by Mr. Tucker, from the Committee on Ways and Means, on Tuesday, do not have so good a send-off as those who are anxious to promote any legislation which will tend to break down protection to American industry could have wished. As to the sugar and general tariff bills, it is evident they were reported by consent of several members of the committee who reserve the right to vigorously oppose them on the floor of the House. Their chances of passing are, in any event, unusually small, we think. Concerning the hoop iron bill, General Garfield submits a minority report, in which he holds it up in its true light. To accommodate the Standard Oil Company, it is proposed to ruin an important American industry, and in so doing to make an invidious distinction against hoops and hoop iron which is as unjust as it is uncalled for. General Garfield makes some telling points against the hoop iron bill, and it is to be hoped that the minority report will kill it.

NEW PUBLICATIONS.

SPON'S DICTIONARY OF ENGINEERING SUPPLEMENT. Parts 7 to 10, both inclusive. E. & F. N. Spon, London and New York, publishers.

A number of additional parts of Spon's Supplement have been published, bearing out fully the promise of the earlier numbers, to which we had occasion to direct the attention of the readers of *The Iron Age* some time since. Among the subjects treated fully in the present volumes are coal mining machinery, notably coal cutters and coal-getting apparatus, and the very important question of automatic wire rope traction in collieries is referred to, together with many kindred topics. Then a number of illustrations showing the constructive details of coke ovens, among which are the Gjers oven, used in the North of England; the Appolt, employed largely on the Continent; the Eaton and the Gobiet, the Coppée, the Galloway and others. We are somewhat surprised to find the Holloway process so elaborately treated under the head of "Copper," while there is no mention of many well tried and meritorious improvements made during the last few years in the metallurgy of that metal. Exhaustive essays are given on docks and on dredging, followed by 20 pages of closely printed and fully illustrated matter on dynamo electric and magneto-electric machines, which will be welcomed by many as a timely and interesting addition to their store of technical literature, as it covers a ground which many engineers have been forced in recent times to survey—a work which has no doubt presented peculiar difficulties. The eighth part is closed by a review of recent progress in the construction of dynamometers, while the whole of the ninth part and a portion of the one following is given to "Electrical Engineering," a branch of the profession which is rapidly assuming a position of equality in importance with that of others. Grouped together under the head of "Engines" are a large number of those designs of machinery which depart more or less from the conventional type. Among them we note the Myers, the Gallahue, Massey, Outridge, Brotherhood, William and West engines, with many of which the readers of *The Iron Age* are familiar. The editor has made room also for the Brown, Rider, and Otto and Hock gas engines, and their latest competitor, as far as low powers are concerned, the Bischoff engine. After brief chapters on "Explosions" and "Fans," follows a long essay on "Founding," which is not brought to a close in Part 10, the last one that has reached us. Probably one-half of the work is now before us, and its editors have succeeded in fully showing that it will be indispensable to all who possess the main dictionary, and that it deserves appreciation as a work by itself.

MULTIPLICATION AND DIVISION TABLE. By Leonard Waldo. John Wiley & Sons, publishers, New York.

For the benefit of accountants, bookkeepers, teachers and others, Mr. Waldo has compiled a number of tables, covering four large pages, in which all the multiples of figures between 1 and 100 are given. The printing and setting of these tables are admirable, and present the means for very rapidly reaching the results desired. For some, however, we fear the size will prove inconvenient.

The Canadian Tariff and the Hardware Trade.

A correspondent of the *Ironmonger*, London, writing from this country, gives the following account of the working of the Canadian tariff in the hardware trade:

The Canadian tariff is not working smoothly, and in the measures adopted by the government for its enforcement great injustice is done importers, especially those doing business with the United States. A few days ago an important meeting of Canadian dealers in hardware and plated goods was held in Toronto, and similar meetings have since been held in other cities. The object of these meetings was to protest against the arbitrary and often seriously unjust policy of the customs authorities in the valuation of imports. For example, a Canadian merchant of average standing buys a bill of goods in the United States and brings them to Canada for entry. We are presuming, of course, that he is doing business honestly and wants to pay his duties fairly. The duty on the goods in question is ad valorem—say, 30 per cent. His invoice shows that he purchased them at, say, 45 per cent. discount from the American list. The Canadian appraisers look at *The Iron Age* and find that the discount there quoted on the goods in question is, say, 30 per cent. The importer may present unquestionable proof, not only that he bought the goods at the price shown on his invoice, but that any other Canadian dealer can buy like goods at the same price, or possibly a great deal better if he buys largely and has good connections. This, however, counts for nothing. The importer is required to correct his invoice, making the price discount 30 per cent. from list, and pay duty accordingly. Sometimes he is allowed to enter the goods at the invoice valuation, and after he has sold them the customs authorities come after him on the charge of under-valuation, requiring him to correct his invoice and pay a higher rate of duty than was assessed in the first instance. The injustice of this course is apparent to any one acquainted with the hardware trade. The prices quoted in *The Iron Age* are, no doubt, as correct as they can be made, but they represent the price at which the average retail dealer can buy the goods quoted from the manufacturer's agent or the jobber. They are not, and do not claim to be, the best prices at which large buyers favorably situated can buy. But if they did, it would not be fair to make all Canadian invoices square with them. There always has been, and always will be, a special discount on goods for export. The average Canadian dealer who can buy at all can get from 10 to 15 per cent. better terms than the average American dealer, while the favored Canadian dealer who buys in the United States can get a discount probably larger than the most favored jobber purchasing largely would expect. The Canadian importers feel that, as this special discount for export is a regular and recognized price in the trade, it ought to be accepted as the invoice valuation of imports. The Customs authorities say that this is only a subterfuge on the part of manufacturers in the United States to make Canada a "dumping ground." They are apparently determined that the people of Canada shall not have the advantages of cheaper prices than our manufacturers charge on goods for domestic consumption, and to place as many obstacles as possible in the way of trade with the United States. Another trouble which gives rise to serious complaint is that there are not more than two or three well-appointed custom houses in Canada which are properly equipped for the work expected of them. Most of the officials are new men, full of untempered and indiscreet official zeal. As might be expected under such circumstances, a good deal of favoritism is shown. There are some importers whose position and influence are such that their invoices pass unchallenged, and they can import what they please at pretty much whatever figure they are pleased to swear to as price paid. But the average importers, doing business on a more modest scale, and without the large influence which belongs to wealth and high position, have no such consideration shown them. What is sauce for the large goose is not sauce for the small gander in Canada. This gives rise to serious dissatisfaction. But the great trouble is that Mr. Tilley and his officers cannot, or will not, see that the selling price quoted to the average dealer in the United States is not the price at which the manufacturers of this country are glad and eager to sell the merchant who buys for export to Canada. They insist, in effect, that the Canadian importer has no right to buy under the open market prices quoted to the home trade; that *The Iron Age* quotations are correct, and consequently that the importer whose invoice shows a larger discount than that journal quotes is attempting the old trick of defrauding the government by under-valuation. Whether they hold this same view with regard to the invoice valuations of English goods brought into Canada, I do not know. Owing to a different system of quotations, there is less opportunity, apparently, to compare domestic and export prices. From the tone of the discussions at the meetings, I conclude that the tariff will not have a very enthusiastic support from the hardware trade. The complaint is general that the honest merchant who wishes to conform to the law can with difficulty make a living. At the Toronto meeting a New York merchant was quoted as saying, in reply to an inquiry as to the condition of business, "Trade with Canada is extremely dull, but the frontier trade is very heavy." This tells the whole story. Upon inquiry I learn that dealers in New York are having large and continuous orders from towns conveniently near the border, and who, in some instances, are now buying in a month more than they used to consume and distribute in a year. When asked what becomes of their goods the dealers say they really have no idea, and, furthermore, that it is none of their business. To protect the frontier and suppress contraband trade would be a work the Canadian government would find practically impossible. The Canadian people who buy American goods find some way of getting them home without troubling the Customs officials. When Canada was a cheaper market than ours, the irregular importations were enormous, and it was found impossible to stop the traffic, although arrests and seizures were made daily. The Canadian government, with its new force and its unequally populous border-line, has even less chance than our government had to suppress contraband trade. As a consequence of their policy toward honest importers and their inability to suppress the dishonest ones, trade with Canada languishes, while that with the border towns and villages is unusually heavy and well sustained.

The Latest Fast Passenger Locomotive.

So much attention has been given within the last few weeks to the fast passenger locomotive built recently by the Baldwin Locomotive Works, of Philadelphia, and so much erroneous data have been published in regard to its construction, that the following accurate data, for which we are indebted to the *Railroad Gazette*, will assist in forming a correct idea of its leading features:

On the Pennsylvania and some other lines a great deal of trouble has been experienced in the fast passenger engines from the breaking of crank-pins and coupling, or parallel rods. On receiving the order for a locomotive to make the run between New York and Philadelphia, over the Bound Brook line, in two hours, the proprietors of the Baldwin Locomotive Works determined to use but one pair of driving wheels, and thus dispense entirely with coupling rods. With this arrangement the weight which can be utilized for adhesion must either be very considerably less than it would be if two pairs of wheels were coupled, or else there will be an excessive load on the single pair of driving wheels. To provide for this difficulty, the new engine is arranged with equalizing levers between the driving and trailing wheels. Each lever has a fulcrum, which works in a slot Between this fulcrum and the driving wheel a cam is arranged, which can be thrown down by a steam cylinder and piston, so as to form a bearing for the equalizing lever, and thus take the weight off from the fulcrum which is shown. The cam then becomes the fulcrum of the lever, and one arm of the latter is thus lengthened and the other shortened, and consequently a larger proportion of the weight of the engine then rests on the driving wheels. It is intended that this arrangement shall be used only in starting, or on heavy grades.

The dimensions of this engine are as follows: Cylinders, 18 by 24 inches; total wheel base, 21 feet 1 inch; from center of driving to center of trailing wheels, 8 feet; boiler made of steel, 7-16-inch thick; diameter of boiler at smoke-box end, 52 inches; 198 tubes, 2 inches diameter by 12 feet 2¾ inches long; fire-box, 96½ inches long by 84 inches wide, 51 inches deep in front and 44 inches back; grates, made of water tubes, 1⅞ inches outside diameter by ¼-inch thick, spaced 2⅜ inches from center to center, with three bars arranged to pull out.

The truck has a swing bolster and four 36-inch wheels, with cast-iron centers and steel tires. The journals of truck axles are 5 by 8 inches; steam ports, 1⅝ by 16 inches; exhaust ports, 3 by 16 inches. The valve is of the Allen pattern, with ⅞-inch lap. The cross-heads are made of solid wrought iron, with brass gibs on slides. The driving wheels are 6 feet 6 inches in diameter, with cast-iron centers, having solid spokes and hollow rim. The tires are 3 inches thick. The driving axles are made of wrought iron, with journals 8 by 9½ inches. The trailing wheels are 45 inches in diameter, with cast-iron center and steel tires. The journals of trailing axle are 7½ by 8½ inches. The boiler is supplied with two injectors; no pumps are used. The tender carries 4000 gallons of water. The tender frame is made of channel iron, and the tender wheels are 36 inches in diameter, with cast iron centers and steel tires.

The tender axle journals are 5 x 8 inches. The weight of engine in working order is 85,000 pounds, making the weight on the driving wheels from 35,000 to 45,000 pounds, and the weight on the trailing wheels from 15,000 to 25,000 pounds. The weight on the truck is 25,000 pounds. The top and sides of the fire-box are stayed with ⅞-inch stay bolts. The boiler has 1400 square feet of heating surface.

This engine has an extended smoke-box, which is 50 inches long, measured from the front of the tube sheet. The arrangement of the inside of the smoke-box is somewhat different from the usual practice. In front of the tubes a sheet-iron deflector is placed, which is inclined from the top row of tubes downward and forward, with an opening below its lower edge and the bottom of the smoke-box. This opening can be increased or diminished by means of a movable section attached to the deflector. The smoke-box is divided into two parts by wire netting having 3½ meshes to the inch, which is fastened to the tube sheet just above the top row of tubes, and extends horizontally forward to the front and to both sides of the smoke-box. The exhaust pipes are carried up through this netting, and have a single nozzle 4⅛ inches in diameter just above it. The smoke-box can be cleaned from a hand hole, shown in the engraving, on the under side of the extended smoke-box.

As considerable curiosity has been manifested regarding the working of this engine, it may be said that thus far it has been running only in an experimental way, and, as happens in all new engines, some little time is required before all the bearings work quite satisfactorily and the boiler is thoroughly freed from grease, and the exhaust apparatus is adjusted in the most efficient way. On one trip, though, it ran, with a train of five empty passenger cars and a baggage car, from Trenton Junction to Bound Brook, a distance of 27.1 miles, in 26¾ minutes. In this distance there is a straight line of 13.8 miles, which was made in 11 minutes, which is at the rate of a little over 75 miles per hour. At the time, though, the engine was not steaming well, and no doubt it will be able to make even faster time than this.

METALLURGICAL NOTES.

SULPHUR IN COAL.

A very important fact, metallurgically, is that sulphur does not, as has been very frequently assumed, exist in coal in the form of bisulphide of iron or pyrites, but that it is present very often in other forms, which makes its elimination by washing a more difficult matter. Dr. William Wallace, of Glasgow, gives the following table, which shows how large a proportion of sulphur is due to other sources than pyrites, the first column giving the total sulphur, and the second the sulphur as bisulphide:

	Per cent.	Per cent.
Ell coal (Lanarkshire)	.91	.11
Main coal	.60	.42
Splint coal	.46	.14
Pyotshaw coal	.68	.17
Soft coal (from Fife)	.93	.49

The amount present as bisulphide was calculated from the iron found in the ash of the coal, an assumption which leaves out of account the fact that sometimes coal contains iron in the shape of carbonate of iron.

ALUMINA IN DEPHOSPHORIZING IRON.

M. A. Lencauchez, a French metallurgist, has again, in a paper read before the Society of Engineers, reasserted his claims as one who correctly grasped the problem of dephosphorization long before it was approached by Messrs. Thomas & Gilchrist. While little interest attaches to this and similar efforts made to make the basic lining common property, other statements made by M. Lencauchez deserve mention. Some trials were made at Fourchambault and at Montataire in the dephosphorization of pig in the puddling furnace by means of bauxite, a mineral composed, if pure, of alumina alone. By adding this, a phosphate of alumina is formed, which has the advantage of being the most stable of all phosphates, not being reduced by carbonic oxide, even in the presence of silica. At Montataire the experiments were conducted in an ordinary reheating furnace, a mixture of powdered bauxite, lime, and oxide of iron and manganese being heated strongly until a fritted mass of aluminate of lime and oxides of iron and manganese was obtained. The puddling of the pig, which in this case was Frouard pig from the vicinity of Nancy, proceeded in the ordinary manner until the metal began to come to nature. Then about 22 to 25 pounds of the aluminate were taken from the reheating furnace, where it was kept at a high temperature. The working was then continued in the ordinary manner, the result being wrought iron containing only 0.08 per cent. of phosphorus. M. Forey, of Fourchambault, reports that, by the use of 22 to 28 pounds of bauxite, the phosphorus in the pig—0.4 per cent.—is reduced to 0.08 per cent. in the iron. It was found, however, in the course of experiments made at a number of mills, that good results were obtained only when gray pig, low in silicon, was used. The following analyses of the bauxite show the nature of the material clearly:

	Silica.	Alumina.	Peroxide Iron.	Lime.
No. 1	10.40	66.99	5.71	0.00
No. 2	10.90	67.21	5.14	0.00
No. 3	11.80	53.46	23.90	0.00
No. 4	11.90	53.51	23.90	0.00
No. 5	34.50	29.44	23.20	0.00
No. 6	9.80	41.62	35.08	3 15
No. 7	9.70	41.54	35.46	3.10

Nos. 4 and 6 are used as a flux in smelting Algerian ores at Beaucaire. M. Lencauchez announces also that he has revived the Maudlay furnace, first proposed in 1858, its construction being similar to that of the Pernot furnace. He states that he has added some features, blowpipe combustion and a special tuyere, with the aid of which he hopes to carry the production per diem higher than the furnaces of a similar type now at work. It appears that the Messrs. de Wendel, of Hayange, are going to put up this plant, which is to include a "recuperator," or regenerator of the type introduced and built by Messrs. Gaillard, Haillot & Co., of Paris.

Conflicting Bank Laws.—Replying to an inquiry from the Secretary of the Treasury, as to whether the fourth section of the act of June 30, 1874, was repugnant to the previous statutory provision in reference to the deposit of bonds by national banks, the Solicitor General, in an opinion approved by the Attorney-General, sent to Secretary Sherman says: Upon the whole, I am of opinion that, taken with its context, section 4 of the act of 1874 is, for all purposes connected therewith, repugnant to section 5160 of the Revised Statutes and all other previous legislation that requires national banks to have and maintain in the Treasury of the United States a bond deposit to the amount of one-third of their capital. There is enough in the case to warrant that official vigilance which has raised and made it necessary to decide the question highly commendable, but even if the question were more doubtful, great weight would have to be attributed to the contemporaneous understanding by all practically concerned as to the operation of the provision before me, in consequence of which, without demur from any one, the provisions of section 5160 have been disregarded by many officers and other citizens of more than ordinary intelligence and character, in immense transactions occurring from day to day during more than five years.

The New Tariff Bills.—Tucker and Garfield's Reports on the Hoop Iron Duty.

(*From Our Own Correspondent.*)

WASHINGTON, D. C., May 12, 1880.

The bill relating to the duty on hoop iron and the accompanying reports are now formally before the Committee of the Whole. The text of these documents, which explains the position of the Ways and Means Committee on this important subject, will be found below. The following is the bill prepared by Representative Tucker:

Be it enacted by the Senate and House of Representatives of the United States in Congress assembled:

Section 1. That the Secretary of the Treasury be and he is hereby authorized and directed to cause to be levied upon all articles under the designation of "cut hoops," "hoops cut to lengths," "hoops cut and punched" and "barrel hoops," the duty of 35 per cent. ad valorem, which shall be shown by satisfactory proof to have been ordered under *bona fide* and absolute contract, made and entered into prior to March 12th, 1880, and which shall be imported from any foreign country into the United States prior to the first day of January, 1881.

Section 2. From and after the approval of this act there shall be levied, collected and paid upon all band, hoop and scroll iron of every description a duty of 35 per cent. ad valorem.

Section 3. All acts or parts of acts inconsistent with this act shall be and are hereby repealed.

Then follows the report of Representative Tucker for the majority. It leads off with the letter of the Secretary of the Treasury to the Attorney-General, and the decision of the Attorney-General as to the powers of the Secretary in returning to the old specific rate, and the letter of the Secretary of the Treasury to the Speaker of the House of Representatives, turning the whole question over to Congress, with the statement that if no action were taken within a limited time the customs officers would be instructed to levy the specific rate. Representative Tucker then says:

The Committee of Ways and Means, to which has been referred the letter of the Secretary of the Treasury of date of March 12, 1880, and hereto annexed, having fully considered it, make the following report: The question for adjudication, to which the Secretary refers, is a mixed one of law and fact, and your committee, without a full examination of all the testimony which might be adduced on the trial of a case involving its decision, could not undertake to decide it satisfactorily.

But it is observed that, on the faith of the authoritative orders of the Secretary of the Treasury, contracts may have been made to import the articles of hoops, cut to lengths, under the duty of 35 per cent. ad valorem, it would be unjust to any persons making such contracts *bona fide*, prior to the date of the letter of the Secretary, to exact of them the higher specific duty imposed under the act of June 30, 1864, upon "band, hoop and scroll iron," your committee have thought it proper to report a bill the first section of which provides that in all such cases the duty to be paid shall be the 35 per cent. ad valorem.

The question still remains whether any action shall be taken by Congress to settle by law the point upon which there have been various judicial decisions referred to by the Secretary of the Treasury, that is, whether "hoops cut to length," and such like articles, shall pay the specific duty imposed on band, hoop and scroll iron, or the duty of 35 per cent. ad valorem on articles, vessels and wares not otherwise provided for. And this involved a further inquiry, Shall hoops cut to length and punched at the end, which are in a more advanced state of manufacture than "band, hoop and scroll iron" not so cut and punched, pay a less rate of duty than the latter? Or, in another form of the question, Shall the latter pay a higher rate of duty than the hoops cut to length and punched?

Your committee sees no reason for putting different rates on these several classes of band, hoop and scroll iron, and the question therefore is, Shall the same rate be imposed? and if so, shall it be the higher specific duty or the lower ad valorem. The revenue collected from all band, hoop and scroll iron at the specific rates of duty now imposed was for 1878, $7858.63, and for the year 1879, $6263.71. The specific duty is nearly prohibitory. On the other hand, the contention which has arisen shows, as well as the numerous contracts of which the committee has been informed, that at 35 per cent. ad valorem a very large revenue will be collected. On one contract for hoop iron for 25,000 tons to be imported, the duty collected at the ad valorem rate will be $262,500, and none of this would be imported, in all probability, were the higher specific duty demanded.

Your committee, therefore, report and recommend the passage of the accompanying bill, the second section of which imposes on all band, hoop and scroll iron of any description the duty of 35 per cent. ad valorem.

THE DUTY ON HOOP IRON.

Representative Garfield, from the Committee on Ways and Means, to whom was referred the letter of the Secretary of the Treasury of March 12, 1880, relative to the duty on cut hoops, on Tuesday submitted the following as the views of the minority:

The subject referred to this committee by the House, in the letter of the Secretary of the Treasury, is sufficiently stated in the report of the majority of the committee, which provides:

1. That all cut hoops, hoops cut to length and punched, and band hoops which were purchased abroad before March 12, 1880, may be imported at any time before Jan. 1, 1881, at a duty of 35 per cent. ad valorem.

2. That all such hoops and bands purchased since March 12, 1880, and imported before this bill becomes a law, shall pay the duty prescribed by existing law, that is 1¼, 1½ and 1¾ cents per pound, according to thickness.

3. That hereafter the duty, not only on cut hoops, but upon all band, hoop and scroll iron of every description, shall be reduced to 35 per cent. ad valorem.

The undersigned concur in that provision of the bill which grants relief to those importers who made absolute and *bona fide* purchases of cut hoops before the Treasury order of March 12, 1880, but not yet imported, though it is not improbable that many of these purchases were made in anticipation of the order.

But we object to the third section of the bill as wholly unwarranted by any just principle or by any complaint against existing law. If the committee had confined the provisions of this section to cut hoops they would have done at least this service, they would have prevented litigation and ended an expensive controversy by deciding the question in favor of the importers and foreign manufacturers. But in removing an ambiguity from a single paragraph of the law, they have thrown a dozen pages of the statutes into the utmost confusion. They have separated one group of products—hoops and band iron—from the general provisions of the iron tariff and reduced the duty more than one-third, wholly out of proportion to the rates on other manufactures of iron.

The only reason assigned by the majority for this change of the law is that the present rate of duty—1¼, 1½ and 1¾ cents per pound—is nearly prohibitory, and the proposed reduction of rate will largely increase the importations and augment the revenue.

The allegation that the present duty is exorbitant is based upon the recent temporary advance in the price of iron, and the argument for the increase of revenues will apply with equal force to nearly all the provisions of the iron tariff which are not touched by any of the bills which the committee have framed.

The undersigned object to the change in the third section, because:

1. It will destroy at least $6,000,000 of capital now invested in machinery specially and exclusively applied to this particular branch of merchandise in Massachusetts, New York, Pennsylvania, Ohio and other States.

2. It will turn out of employment not less than 5000 artisans and laborers who are now engaged in this special manufacture, and at least 10,000 more who are engaged in the production of the material of which hoop iron is made.

3. It will transfer the profits of these manufactures to the importers and to our rivals in foreign countries, and will not materially reduce the cost of the finished product to American consumers.

This is shown to be the fact, that since the importation of cut hoops under the Treasury ruling of 1878 has been allowed at 35 per cent., the importers and foreign producers have fixed the prices at so small a fraction below the price at which the American manufacturer can produce them, that only a very small advantage has accrued to the consumer and the home production has become impossible.

4. It is wholly out of harmony with the duties imposed by existing laws upon every other form of iron manufacture, as may be seen by examining the Revised Statutes (Boutwell's edition, pp. 464, *et seq.*)

It violates two principles which have controlled nearly all our tariff legislation since the foundation of the government. First, that all imported articles which are alike in kind and in their relation to the wants and industries of the United States, shall be treated alike in the customs laws. Second, That imported articles which come into competition with the industries of this country shall bear a rate of duty proportioned to the amount of skill and labor employed in their production.

We do not say that these principles appear in exact mathematical proportions in all our legislation, but it has been the manifest purpose of Congress so to apply them to the tariff law that the more labor and skill are embodied in any competing product the higher rate of duty it shall bear. These principles were clearly recognized in the first tariff act, being the second law passed by the first Congress, July 4, 1789, and finds repeated illustration in a very general tariff law since enacted. The act of April 12, 1816 (3 Stat. at Large, 312) imposed on hoop iron (as the more advanced manufacture) a duty of $2.50 per hundredweight, while the duty on bars and bolts (the less advanced) made by rolling was $1.50 per hundredweight. The act of April 20, 1818 (3 Stat. at Large, 460) imposed a duty of 50 cents per hundredweight on pig iron; on castings, 75 cents per hundredweight; on spikes, 3 cents per pound, and on nails, 4 cents per pound. By the act of May 24, 1824 (4 Stat. at Large, 27) the duty on bar and bolt iron not made by rolling, was 90 cents per hundredweight on nail rods, and hoop iron, 3 cents per pound, and on iron wire 9 cents per pound. The same proportional rates were maintained in the act of July 14, 1832 (4 Stat. at Large, 587). The act of March 2, 1833 (4 Stat. at Large, 629), which became historical, and was passed to allay the threats of nullification, provided for scaling down the duties of the then existing laws, year by year, but preserved the relative rates on the various forms of iron, and concluded by providing that in 1842 the duties should be at an ad valorem rate. The effect of this provision was to place a lighter duty upon crude manufactures and a heavier duty upon those more advanced. The act of August 30, 1842 (5 Stat. at Large, 551), fixed a duty of $9 per ton on pig iron, $17 per ton on bar and bolt iron not manufactured by rolling, $25 per ton on bar and bolt iron rolled, and on hoop iron 2½ cents per pound. By the act of July 30, 1846 (9 Stat. at Large, 45, Schedule 6), a duty of 30 per cent. ad valorem was levied on all forms of iron, which again effectively recognized the doctrine that the duty should increase as the product is rendered more valuable by skill and labor.

The same principle was maintained in the act of March 3, 1857 (11 Stat. at Large, 192), in which the iron schedule of the preceding act was reduced to 24 per cent. ad valorem. The act of March 2, 1861 (12 Stat. at Large, 180), levied a duty of $15 per ton on bar iron, and $20 per ton on band and hoop iron; and the act of July 14th, 1862 (12 Stat. at Large, 544), which levied duties in addition to those of the former act, increased the duty on bar iron $2 per ton, and on hoop iron, $5—thus maintaining the principle of gradation even on the slight increase of rate. The provisions of the next general tariff act, that of June 30th, 1864 (13 Stat. at Large, 203), are still in force, and it is a clause of that act which this bill of the committe seeks to amend.

The provisions of the Act of 1864—generally and particularly the clauses under consideration—are in perfect harmony with the principles which have marked the tariff legislation from the origin of the government, under all parties and all administrations.

By the existing law pig iron pays a duty of $7 per ton. (Revised Statutes, p. 464.) Bar iron—a more advanced form of manufacture—bears a duty of 1 to 1¼ cents, according to sizes. Iron wrought into slabs, blooms and loop, and other forms less finished than bars and more advanced than pig iron, is rated as bars; but band and hoop iron, being more advanced than bars, and representing more skill and labor, pays a duty of 1¼ to 1¾ cents per pound, according to sizes. The anomaly forced into the law by the verdict of a jury made it possible for the foreign producer, by the expenditure of five shillings' worth of labor upon a ton of hoop iron, in cutting the long strips into shorter pieces and punching a hole in one end of each piece, to import this class of iron into this country under the name of "cut hoops" at 35 per cent. ad valorem, which at present prices is more than one-third less than the duty on the long uncut strips. This was a palpable evasion of the law, which the Treasury order of March 12 presents.

It is impossible to contract the duty imposed by the existing law upon the various articles of iron and steel manufacture, without seeing that it is the manifest intention of these laws to impose a higher duty as the article approaches completion.

The third section of the pending bill overturns and reverses this hitherto unbroken rule. It was never before proposed to enact a law which levied a higher duty on bar iron than on hoop iron, the more advanced form of manufacture. This bill singles out hoop iron from the whole list of iron products, and stikes it a fatal blow by making its manufacture in this country impossible. No further argument is needed to prove the injustice of this measure.

The undersigned are not opposed to a revision of the tariff or a reduction of rates whenever this can be done in harmony with the principles herein set forth; but, believing that the provisions of the third section are partial and unjust, we recommend that the whole section be stricken out from the bill.

The majority report was sustained by Wood, of New York; Tucker, of Virginia; Gibson, of Louisiana; Morrison, of Illinois; Mills, of Texas; Carlisle, of Kentucky; and Felton, of Georgia—7, all Democrats.

The minority report was sustained by Phelps, of Connecticut, Democrat; and Garfield, of Ohio; Kelley, of Pennsylvania; Conger, of Michigan; Frye, of Maine; Dunnel, of Minnesota, Republicans—6.

The Committee of Ways and Means have just prepared the following revise of their bill to regulate customs duties upon certain articles named therein.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the importation of the following articles shall be exempt from duty:

Woolen rags, shoddy, mungo, waste and flocks.

Books, periodicals, pamphlets and all printed matter, engravings, bound or unbound, illustrated books and papers, maps and charts, and music, printed with lines, bound or unbound.

Cod-liver oil, crude or refined, and crude petroleum.

Sumac.

Chrome ore.

Barks—Quilla, Peruvian, Lima, calisaya, and all cinchona barks, canella alba, pomegranate, croton, cascarilla, and all other barks not otherwise provided for, wherever grown or produced.

Extract of hemlock.

Cut nails and spikes.

Cast-iron butts and hinges.

Section 2. There shall be levied, collected, and paid upon all articles named in schedule A of section 2504, title 33, of the Revised Statutes, a duty of 30 per cent. ad valorem.

Upon wools named in schedule L of the same section and title as classes numbered one and two, a duty of 35 per cent. ad valorem.

And on wools therein named as class numbered three, a duty of 20 per cent. ad valorem.

Upon all carpets of every description, and druggets and bockings, printed, colored or otherwise, and all carpets or carpeting of wool, flax or cotton, or parts of either, or of other material not otherwise specified, and on all mats, rugs, screens, covers, hassocks, bedsides and other portions of carpets or carpetings of like character or description, a duty of 30 per cent. ad valorem.

On all flannels, blankets, hats of wool and knit goods, 40 per cent. ad valorem.

Upon all other articles not herein otherwise specified, named in schedule L of said section and title of the Revised Statutes, a duty of 45 per cent. ad valorem.

Upon buffalo robes, of all kinds, 10 per cent. ad valorem.

Upon steel railway bars, 1 cent per pound.

Upon locomotive tires and parts thereof, 2 cents per pound.

Upon anchors or parts thereof, 1¼ cents per pound.

Upon anvils, 1¾ cents per pound.

Upon iron cables or cable chains or parts thereof, 2 cents per pound.

Upon chains, trace chains, halter chains and fence chains made of wire or rods not less than ¼ inch in diameter, 1¼ cents per pound. Less than ¼ inch in diameter and not under No. 9 wire gauge, 1½ cents per pound; under No. 9 wire gauge, 30 per cent. ad valorem.

Upon horseshoe nails, 2½ cents per pound.

Upon bed screws, wrought-iron hinges, wrought board nails, spikes, rivets and bolts, 2 cents per pound.

Upon mill irons and mill cranks of wrought iron, and wrought iron for ships, steam engines and locomotives, or parts thereof, weighing each 25 pounds or more, 30 per cent. ad valorem.

Upon blacksmiths' hammers and sledges, all hand saws and back saws of all descriptions, all files, file blanks, rasps and floats of all descriptions, needles for knitting or sewing machines, all cutlery, other than penknives, jack knives and pocket knives of all kinds, 25 per cent. ad valorem.

Upon screws usually called wood screws, 2 inches or over in length, 5 cents per pound; less than 2 inches in length, 7 cents per pound; provided, however, that all rolled or hammered iron, or round iron in coils, imported for the sole purpose of manufacture of said wood screws, may be imported under such regulations as the Secretary of the Treasury shall prescribe, at a duty of 35 per cent. ad valorem.

Upon chromate and bichromate of potash, 2 cents per pound.

Upon aniline dyes and colors by whatever name known, 30 per cent. ad valorem.

Upon hatters' plush composed of silk and cotton, but of which cotton is the component material of chief value, 15 per cent. ad valorem.

Upon lead ore, lead in sheets, pipes, or shot, lead in pigs or bars, and old scrap lead, fit only to be remanufactured, and manufactures of lead not otherwise provided for, 30 per cent. ad valorem.

Upon copper imported in the form of ores, regulus of copper, and on all block or coarse copper, 3 cents on each pound of fine copper contained therein. On all old copper fit only to be remanufactured, 3 cents per pound. On copper in plates or bars, ingots, pigs, and in other forms not manufactured or here enumerated, copper in rolled plates called braziers' copper, sheets, rods, pipes and copper bottoms, all manufactures of copper or of which copper shall be a component of chief value, not otherwise provided for, and all sheathing or yellow metal not wholly of copper nor wholly nor in part of iron ungalvanized, of all descriptions, 25 per cent. ad valorem.

Upon percussion caps, 35 per cent. ad valorem.

Upon opium, $1 per pound.

Upon opium prepared for smoking, and all other preparations of opium not otherwise provided for, $10 per pound.

On all brown earthenware and common stoneware, gas retorts and stoneware not ornamented, 20 per cent. ad valorem.

On all other earthenware, except china, porcelain, and Parian ware, and on stoneware not included in the next preceding clause, on crockery ware, white, glazed, edged, painted, printed, dipped, or cream-colored, composed of earthy or mineral substances, 30 per cent. ad valorem.

Upon rice, cleaned or uncleaned, and on paddy, 50 per cent. ad valorem.

Upon wood pulp, for manufacture of paper, 10 per cent. ad valorem.

Upon jute butts, $3 per ton; on unmanufactured flax, and all other fibers or fibrous material for the manufacture of paper, $10 per ton.

Upon paper sized or glued, suitable only for printing paper, 20 per cent. ad valorem; printing, unsized, used for books and newspapers exclusively, 15 per cent. ad valorem; manufactures of or of which paper is a component material not otherwise provided for, 25 per cent. ad valorem.

Upon types (new) and type metal, 10 per cent. ad valorem.

Upon plows, harrows, spades, shovels, hoes, mattocks, picks, axes, scythes, hatchets and other like articles of which iron or steel is a component material, used for agricultural, mining or mechanical purposes, 25 per cent. ad valorem.

SCIENTIFIC AND TECHNICAL.

A Canadian, Mr. D. M. Lamb, has invented a method of

PREPARING WATERPROOF FABRICS,

which has been attracting a good deal of attention during the last few weeks. "Neptunite," as he calls the liquid he uses, is a solution of certain gums and of rubber. The fabrics treated with it are are not moistened by water, which runs off from them like quicksilver. The articles, after being dipped in the solution, must be dried for 24 hours in a temperature of from 160 to 180 degrees. They appear to lose little of their pliability or color, have been thoroughly tested and are claimed to have stood the ordeals well. Boiling water, soap or alcohol does not, it is said, remove the neptunite from the fabrics rendered waterproof by it.

A novel and important communication has been made by Prof. Hughes, the well-known inventor of the microphone, to the Society of Telegraph Engineers on

MOLECULAR CHANGES IN IRON AND STEEL WIRE.

He discovered accidentally, about a month ago, that iron or steel wire, after being dipped for a short time, say two minutes, in a solution of sulphuric acid and water become exceedingly brittle and will not bear bending, the metal becoming "rotten." This is not due to mere corrosion of the surface or skin of the metal, because the wire broke even after the outer layer had been carefully removed. The brittle wire shows no change of magnetic conductivity when tested by the induction balance, such as would be the result of heating, straining, tempering, or corroding. There is reason to believe that the suggestion made by Mr. A. Chandler Roberts, that the brittleness is due to absorption of hydrogen by the iron, is the true cause of this peculiar phenomenon. If the wire is immersed in very weak acid, it takes about 30 minutes before it is brittle; when, however, an amalgamated zinc plate is dipped into the same solution and connected to the wire so that a voltaic element is formed, giving off abundant hydrogen at the surface of the iron, the full effect is produced in a minute, owing apparently to the absorption of the hydrogen by the wire. In the latter case, too, the presence of the zinc protects the iron from the action of the acid and, therefore, demonstrates that the brittleness is not due to a mere surface corrosion. Mr. Chandler Roberts has heated the brittle wires of Prof. Hughes in vacuo, and has found that they occlude or absorb about 20 times their volume, irrespective of the "natural gas" in the metal, which amount to from three to ten volumes of hydrogen and carbonic oxide.

Profs. Brackett and Young, of Princeton, have made a series of tests on

THE EFFICIENCY OF THE EDISON DYNAMO-ELECTRIC MACHINE.

The results reached by them were that the total efficiency of the machine is 90.7 per cent., while the available efficiency is 83.9 per cent.

M. Dronier has described a method of making

MALLEABLE BRONZE

by adding from ½ to 2 per cent. of mercury, which probably acts mechanically in modifying the mechanical properties of the alloy. The mercury may be combined with one of the metals of which bronze is made before they are combined, by pouring it into the melted metal and stirring well, or it may be put into the melted copper along with tin or just after the latter has been added, or an amalgam of tin is stirred into the melted copper.

The Value of Non-Conductors for Steam Pipe.

A series of experiments conducted by Mr. Walther-Meunier for the Steam Users' Association of Alsace, strikingly show the importance of using non-conductors in order to prevent the condensation of steam in pipes, &c. Although the various materials and compositions tried differ from those used in this country, so that, directly, the experiments do not afford the means of judging the comparative value of those offered to consumers here, these experiments are of value as illustrating, by a striking example, the economy to be derived by carefully protecting steam pipes. The unit adopted was the weight of water condensed in one hour per square meter of a pipe 2.5 meters long and 150 millimeters in diameter. Both cast-iron and wrought-iron pipes were tested, the results of the experiments with different materials being given in the following table:

Material.	Thickness, millimeters.	Water condensed. Kilogs.	
		Cast-iron pipe.	Wrought pipe.
Grünzweig & Hartmann's	20	0.321	.....
Felt alone	35	0.542	.....
"Kieselguhr"	15	0.657	.....
Reich's	45	0.850	.....
Gay's	24	0.931	0.890
Leroy's	45	.....	0.904
Felt, with metallic lining	50	1.000	.....
Pollock's	50	1.080	.....
Felt, with metallic lining and water-proof linen	50	1.327	.....
Pipe uncovered		3.484	3.906

Taking as an example Grünzweig & Hartmann's composition, it will be seen that a pipe projected by it condenses 3.484—0.321 = 3.163 kilograms of water less per square meter of pipe surface than an uncovered pipe. If it is assumed that 1 kilograme of coal will evaporate 7 kilograms of water, there will be a saving of 1620 kilograms of fuel in 300 working days of 12 hours (a quantity valued at 30 marks), while the cost of covering is estimated at only 4.80 marks.

Another group of sun spots have made their appearance. It will be interesting to note whether any great storms or other aerial phenomena disturb the earth's atmosphere during their continuance. A series of careful observations ought to serve to either prove or disprove the theory of those who think that the sun has a direct influence upon our atmosphere other than its light and heat-giving powers. That solar forces are powerfully felt in the electrical conditions of the earth seems to be an established fact. A few years ago a sudden outbreak of light spots on the sun was accompanied by great electrical disturbances in various parts of the earth. During the sun-spot cycles the Northern Lights are most frequently seen. When the tremendous power and activity of the solar forces are considered in connection with the fact that the sun's distance from the earth is only a little over 100 times its diameter, it seems not unreasonable to conclude that the effects of those forces, when excited to unusual activity, may be felt even at the distance of ninety-odd millions of miles.

The petition of Messrs. P. & T. Collins and their creditors, presented to both Houses of Congress, asks for the passage of a joint resolution requesting the President to bring the matter alleged in their memorial to the attention of the English government, and to instruct the Secretary of the Treasury to give public notice that the United States bonds now in the Bank of England, being the trust fund for the construction of the railroad, will not be paid until their rights to the fund are respected, and asking for such other relief as may be due them by reason of the fact that, as American citizens, their rights and property are being jeopardized by the hostile action of the government of Bolivia in attempting to withdraw a concession and grant of money, upon the faith of which the contractors agreed to build the railroad, and have expended their money.

There is a great quarrel in Mexico between two American companies—the Union Contract Company and the Atchison and Topeka Company—which are seeking railroad concessions over the same route. The Executive granted concessions to both and Congress reported in favor of both, and it only remains for the Senate by a vote to decide the question. The contest continues, Congress and the press somewhat favoring the Union Contract Company.

The iron workers of England include 140,000 laborers in furnaces and forges, 169,000 in the manufacture of machinery, 5500 in steel works, 48,000 in shipbuilding, and about 200,000 in various branches of iron and steel manufacture, making about 570,000 in all. The mining population is about 530,000, and the laborers in cotton mills about 600,000.

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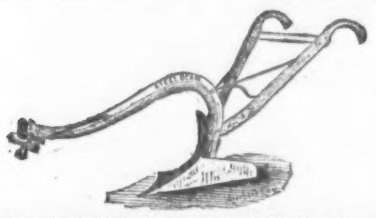

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The only Band Cutter that does not grasp several straws with the band; that is absolutely certain in its operations, and does not fatigue the hand. It will cut, grasp and remove wire, string or paper bands by one single movement. No squeezing, no chafed hands, no blisters, no shears, no slow, hard work, and while threshing it will pay for itself every hour.

EVERY FARMER MUST HAVE ONE

For use with his Self-Binder during the harvest, and when threshing he can save all of the binding material.

Price $9.00 per dozen, net.

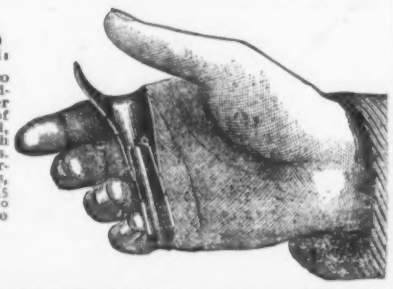
Directions.—Push into bundle, pull out, and by the same movement (or swing of the arm) push point lightly against a board standing in a box to discharge the band. The knife being self-adjusting is always in proper position.

[For cutting off the ends of wire, push curved end of knife with thumb, and pull the other end with finger.]

Every one Warranted.

UNIVERSAL CORN HUSKER.

This Husker is superior to any in the market, being adjustable to the hand, either large or small. Is made of solid brass; easy in the hand, and can be used either with or without gloves or mittens. Is nicely put up in one-quarter gross pasteboard boxes, and is packed 20 boxes (5 gross) in a case. Price, $24.00 per gross, net. In full case lots, discount 25 per cent.



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For beauty, perfection, durability and popularity, "It stands at the head of the list of Lawn Mowers, both in the United States and Europe." The machine is mounted in two large driving wheels or pulleys, and instead of being on the outside of the frame, to run in the uncut grass like other wheel mowers, they are placed inside of the frame back of the cutting blades, running on a shaft each independent of the other, allowing the machine to be turned either to the right or the left without injury to the sod, and to be turned around in a circle no greater than its own length, and cutting at the same time. For prices, address

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BEARDMORE'S PATENT WIRE CLOTH INSERTION SHEET GUM PACKING.
AKRON RUBBER WORKS
ONLY MANUFACTURERS
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Sprague Novelty Works,

15, 17 & 19 North Water Street,

ROCHESTER, N. Y.,

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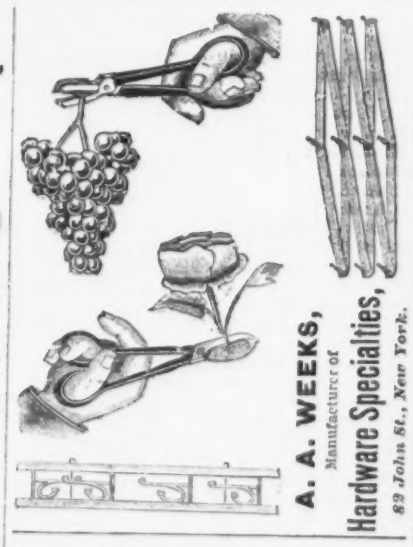
Hardware Specialties,

SPRAGUE'S

"Perfection," "Combination" and other Razor Strops.

Refer to *The Iron Age* first issue of each month.



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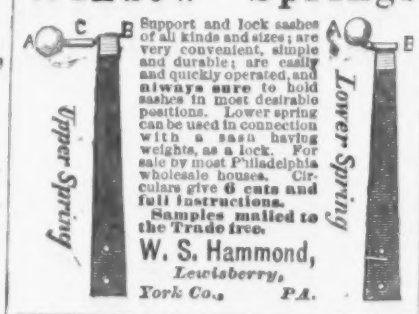
PERFECTION For Portability. For Cutting Quality. For Temper.

Handles of German Silver, Nickel Plated. Blades of the Finest Steel in the World. Every Razor Fully Warranted.

L. C. TOWER, Thermometer Manufr.,
39 Exchange St., Rochester, N. Y., Sole Agent.
Canvassers wanted.

HAMMOND'S Window Springs



Support and lock sashes of all kinds and sizes; are very convenient, simple and durable; are easily and quickly operated, and **always sure** to hold sashes in most desirable positions. Lower spring can be used in connection with a sash having weights, as a lock. For sale by most Philadelphia wholesale houses. Circulars give **6 cuts and full instructions.**

Samples mailed to the Trade free.

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Lewisberry,
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W. R. OSTRANDER,
Manufacturer of
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Speaking Tube Whistles,
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Send for revised catalogue.
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This Cut is Changed Weekly.

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H. K. PORTER & CO.,
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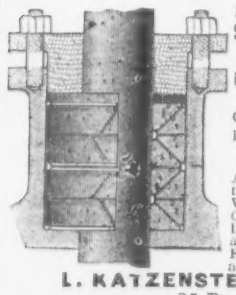
Builders of every variety of
LIGHT LOCOMOTIVES.
Catalogue mailed on application.



KATZENSTEIN'S Self-Acting Metal Packing,
For Piston Rods, Valve Stems, &c.,
Of every description.
For Steam Engines, Locomotives, Pumps, &c., &c.
Adopted and in use by the principal Iron Works and Steamship Companies within the last eight years in this and Foreign countries. For full particulars and references address

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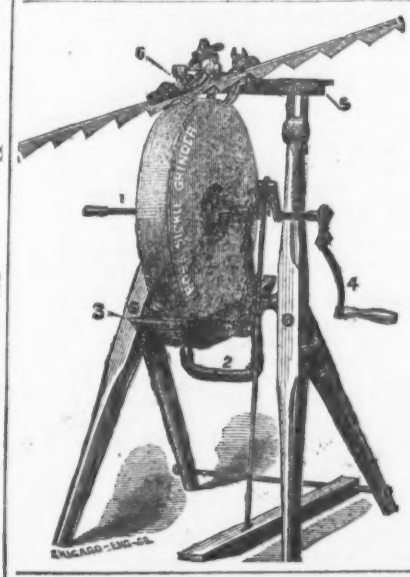

BOSS SICKLE GRINDER,

For 1880.

The only Sickle Grinder ever invented that will grind mower and reaper knives as well as when first made, all having the same bevel, using a flat-face grindstone. It requires only one man to use it. The trade supplied at prices as follows:

With Treadle K. D.....per doz.	$53.00
Without " " ..... "	50.00
Single machines crated with treadle..	4.50
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POWELL & DOUGLAS,
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Send for 24-page catalogue.

LATHROP & CO.,

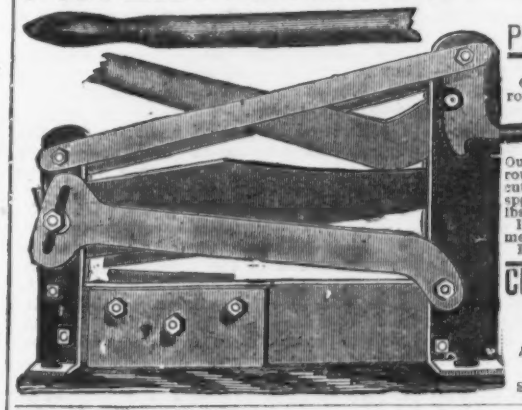
NEWARK, N. J.

PATENT WROUGHT IRON SHEAR,

With and Without

PUNCH ATTACHMENT,

FOR IRON AND STEEL.



Our No. 103 Machine will cut 4x⅜, 1¼ inch round and square and punch ⅝-inch hole through ⅝-inch iron. Our No. 104 Machine will cut 4x⅝, 1 inch round and square and punch ⅝-inch hole through ⅝-inch iron. Our No. 105 Machine will cut 4x¾, 1¼ inch round and square. Our No. 106 Machine will cut 4x⅞ inch round and square. Occupies a space of 8x20 inches, weighs from 200 to 400 lbs., made of wrought iron and steel.

It is built so exceedingly strong that two men cannot injure it. Prices from $30 to $45. Liberal discount to the trade.

CLEVELAND HARDWARE CO.,
CLEVELAND, OHIO,
Manufacturers of
STERLING ANTI-FRICTION BARN-DOOR HANGERS.
Send for Illustrated Circular.

The Original and Genuine.

ALL OTHERS ARE IMITATIONS.

OVER 100,000 NOW IN USE.

JEWETT'S PATENT WATER FILTER

With Porcelain-Lined Cooler.

ACKNOWLEDGED THE ONLY COMPLETE AND SUCCESSFUL FILTER AND COOLER IN THE WORLD.

ISAAC S. WILLIAMS & CO., 728 Market Street, Philadelphia, Pa.—We have sold your "Patent Water Filter" for the last six years. Our sales in that time having reached upwards of five thousand, and in no instance have we heard of any failure in performing all you claim for them.

SEND FOR CIRCULAR.

Address

JOHN C. JEWETT & SONS,
BUFFALO, N. Y.

THE HARTFORD MACHINE SCREW CO.,
Manufacturers of
Hexagon Head Cap Screws, Round Head Set and Cap Screws, Square Head Set and Cap Screws, Machine Bobbins, Gun Screws, Agraffes, Studs,
And other articles turned from Steel, Iron or Brass by automatic machine.
HARTFORD, CONN.
Our facilities are unequaled—the largest establishment of the kind in the country.

Beardsley Scythe Co.,
Manufacturers of
GRASS, GRAIN & BUSH SCYTHES,
Hay Knives & Corn Knives.
West Winsted, Conn.

See our advertisement in *The Iron Age* first issue of each month.

TACKLE BLOCKS.

Rope and Iron Strap of all kinds. Lignumvitæ Wood for Ten-Pin Balls.

Wm. H. McMillan & Bro.,
Office, 113 South Street, New York.
Factory, 32 to 40 Penn St., Brooklyn, E. D.

THE IRON LINE,

FOR THE TRANSPORTATION OF
IRON, IRON ORE, COAL, &c.,
Between
Lake Champlain, New York, Philadelphia, Pa., Wilmington, Del.

For Freight apply to F. W. STARK, 33 Coenties Slip, N. Y., JOSEPH PHILBRICK, 407 West Girard Avenue, Philadelphia, Pa.

Manufactured by THE NAIL CITY LANTERN CO. Wheeling, W. Va.

High Railway Speed.

The fast trains of the Pennsylvania Railroad, between Philadelphia and New York, are now cited as the most complete embodiment of the railway progress of the time to be found in this country. The distance of 88.4 miles on the Pennsylvania Railroad, between Philadelphia and Jersey City, is accomplished in one hour and 59 minutes (being 1 mile in 1 minute and 18 seconds), including one stop, the rate of speed being about 46.12 miles an hour. The distance from Germantown Junction to Jersey City—84.2 miles—is run, without a stop, in 1 hour and 41 minutes, or at the rate of 46.6 miles an hour. The best running time is made between New Brunswick and Trenton going West, and Metuchen and Jersey City East. During the Centennial year a train going West made the distance, 25½ miles, between New Brunswick and Trenton in 26 minutes. Short distances of three miles have been run on this road, near Menlo Park, going East, in 2 minutes and 35 seconds, which is at the rate of 69.25 miles per hour.

It is said that this company contemplate making the run between Philadelphia and Jersey City in 1½ hours, or 90 minutes, which means one mile per minute running time continuously for the whole distance.

To run a train this distance in the time specified would not in itself be considered as remarkable, provided the track was always clear, but several large towns and cities are, however, scattered along the route, necessitating a material reduction of speed in passing through them, and thus time is lost, which must be made up by a proportionate increase in speed on those portions of the roadway which are clear and unobstructed. This increased speed must be as great, at times, as 65 miles an hour.

Some of the earliest locomotives ever built have run over a mile a minute in this country, and 78 miles an hour have been made in England, and in one case 93 miles per hour was attained for a few miles.

The Ironsides, one of M. W. Baldwin's first engines, was run 50 years ago at the rate of 62 miles an hour on the Philadelphia and Germantown Railroad. Mr. Pettit, who was for years connected with Messrs. Baldwin & Co.'s establishment, ran the engine at the time, and her speed was carefully noted by Mr. Franklin Peale and others who took part in the trial.

The old Rocket, built by Robert Stephenson in 1829, for the Liverpool and Manchester Railroad, was run, on one occasion, at the rate of 60 miles an hour; and an engine (the Liverpool) built in 1830 by Bury, Curtis & Kennedy, of Liverpool, was run 58 miles an hour with a train of 12 of the short wagons of that day.

On June 13, 1846, on the Great Western Railroad, of 7 feet gauge, a trial was made of the tractive power of the monster locomotive engine, the Great Western, attached to a train weighing 100 tons, between London (Paddington Station) and Bristol; distance, 118.25 miles.

The train started from London at 13 minutes and 8 seconds before 12 o'clock, and arrived at Bristol 15 minutes past 2 o'clock; time, from platform to platform, 2 hours and 28 minutes, including stops, which averages a rate of 50 miles per hour. Mr. Brunel drove the engine on this trial.

The best time made in England was made by Mr. Brunel, namely, 13 miles in 10 minutes, or at the rate of 78 miles per hour, or one mile in 46 seconds.

The locomotive engine Watt, of the London and Northwestern Railway, ran the special train which conveyed the Queen's Messenger bearing the dispatches containing the decision of the American government in the case of the Trent difficulty, in 1862, from Holyhead to Stafford, a distance of 131 miles, without a single stoppage; the journey was made in 144 minutes, being at the rate of 54½ miles per hour.

In 1869 a locomotive built at the shops of the Chicago and Northwestern Railway, having driving wheels 5 feet 8 inches in diameter, ran a special train 91 miles in 95 minutes, of which run 51 miles were made in 49 minutes.

A locomotive built by the Schenectady Locomotive Works, in December, 1871, with cylinders 16 by 24 and driving wheels 5½ feet diameter, made the run in May, 1872, from Rochester to Syracuse, a distance of 81 miles, in 88 minutes, making one stop of 6 minutes at Clyde. The train ran 81 miles in 82 minutes.

In February, 1880, Alice Oates engaged a special train to carry her from Chicago to Cincinnati, so as to fill an engagement at the latter place. The train made the distance from Lima to Dayton, 72 miles, in 73 minutes, including two stops, which made the speed considerably more than a mile a minute.

For years the Great Western Railway of England was the fastest road in the world, and its express ran regularly from London (Paddington Station) to Bristol, 118.25 miles, in precisely two hours, being at the rate of 59 miles per hour.

In England the fast locomotives have, until recently, had but one pair of drivers, and in the above case the engines had to make 210 revolutions per minute, with 8 feet diameter driving wheels. On the Pennsylvania Railroad the fast trains locomotives have two pair of driving wheels, 68 inches diameter, and have to make about 300 revolutions per minute, to make one mile per minute.

With coupled driving wheels, as in the case of the present Pennsylvania locomotives on the New York line, the centrifugal force of the parallel rods becomes enormous, and is a source of danger. Some time ago the parallel rod of an engine on this road tore lose, demolishing the cab, and tore up the road-bed for a considerable distance.

From the above, it is evident that to run 60 miles in 60 minutes continuously, and with a reasonable degree of safety, some modifications in the construction of the engines as now employed will be required in the direction of dispensing with the parallel rods or in increasing the size of the driving wheels, as well as the amount of heating surface in the boilers, as speed is a question of power and resistance.

To run 90 miles in 90 minutes, as is contemplated between Philadelphia and New York, the locomotive must be capable at all times of developing sufficient horse power to perform 70 miles in one hour. To attain this very high speed the revolving and reciprocating parts must be fully counterbalanced, and the boiler increased in size, so as to have greater evaporative power than those now in use, and the permanent way in the best possible condition attainable and devoid of sharp curves. The greatest speed of the piston in the present engines is at times about 1200 feet per minute with a 24 inch stroke and 68 inch driving wheels, giving about 62 miles per hour; but, with driving wheels 78 inches in diameter and the same speed of piston, the running speed would be 70 miles per hour. No more adhesion is required at high than at low speeds, assuming the load to be the same. To overcome the increased resistance, higher steam pressure per square inch would have to be carried in the boiler, and the substitution of steel plates for iron will both warrant the increased steam pressure and effect a decrease in weight, and tend to keep the boiler as light in weight as those now in use.

The following table shows the speed in miles per hour of the fast lines in Europe and America:

Destination.	Name of railway.	Distance between stations in miles.	Time between stations. hour.	Time between stations. min.	Av. miles per hour, including stops.
Paris to Marseilles		539	15	21	35
Paris to Lyons		339	8	..	40
Berlin to Cologne		364	9	26	38½
Berlin to Magdeburg	Berlin and Hamburg	88½	2	..	53
Spandau to Stendal	Great Northern	57½	1	22	53
London to Edinburgh		397	9	30	42½
London to Plymouth	London and S. Western	246½	6	15	40
London to Holyhead	Great Western	268	6	35	42½
London to Swindon	Northwestern	77½	1	29	53
London to Rugby	Midland	82½	1	42	47.9
London to Leicester		99	2	13	49
London to Peterborough	Great Northern	76¼	1	32	49
New York to Philadelphia	Pennsylvania Railroad	90	2	05	43
New York to Washington	Pennsylvania Railroad	230	6	..	38
New York to Boston	Pennsylvania Railroad	233	7	11	33
New York to Cincinnati	Pennsylvania Railroad	737	26	30	36½
New York to Pittsburgh	Pennsylvania Railroad	444	13	30	35
New York to Chicago	Pennsylvania Railroad	912	34	20	41½
New York to Albany	Hudson River	143	4	05	47.9
New York to Philadelphia	Pennsylvania Railroad	90.4	2	10	43
Jersey City to Wayne Junction	Bound Brook	85.1	1	47	49
Jersey City to Germantown Junction	Pennsylvania Railroad	84.2	1	43	49

The mean average of the above table is 40.1 miles per hour, the English being 46.2 miles per hour; the French, 37.5 miles; the German, 40 miles, and the American 37 miles.

From the above it will be seen that the speeds of the English railways average about 20 per cent. faster than those of American trains.

Driving wheels of 6½ feet diameter are quite as common under English engines as those of 5½ feet in this country. The heavy express engines of the North-Western line have 7½ feet wheels, those of the Great Western line have mostly 8 feet wheels, and some engines with 9 feet, and one of the latter road had driving wheels of 10 feet diameter.

In regard to the destruction of the road by high speeds, Colburne says: "The resistance of trains and injuries they produce on the road are directly as the weights, and, on the other hand, are nearly directly as the speeds. Several authorities have propounded the doctrine that the resistance and wear and tear are as the square of the speed. This is, indeed, generally believed. It is only true, however, when the power expended and injury done in a given period of time are considered. The actual momentary resistance, and the consequent total wear, is only about directly as the speed. A part of the entire resistance is constant at all velocities; the remainder increase as the square of the velocity. Of the whole resistance, the proportion which increases as the square of the velocity is much greater on a bad than on a good road."

According to the experiments made by D. Gooch, locomotive superintendent of the Great Western line of England, on a straight and level track, the resistance increased in a less ratio than that of the simple velocity at speeds of from 13 to 62½ miles per hour.

There is no doubt that inside of five years the distance between Philadelphia and Jersey City will be accomplished in even less time than at the rate of a mile a minute.

Virginia Spelter.—During the last two or three years one of the numerous and extensive zinc deposits of Virginia has been worked in an irregular manner, the product, the Bertha zinc or spelter, acquiring even under such unfavorable circumstances a good reputation for excellence and purity. The mine is located at Martin's Station, Va., and has recently come into possession of parties who have ample means to develop it. Extensive works have been erected which are now producing at the rate of 3 to 5 tons per day. We have seen a number of samples of this Bertha zinc at the office of Messrs. Lucius Hart & Co., exclusive agents, which prove its quality to be exceptionally high, small rods and wires showing an elasticity and ductility remarkable in a metal ordinarily so brittle as zinc. We are informed that it is practically free from lead, and that thorough tests are now being made to establish its value for fine brass, cartridges, German silver and fine castings.

The Permanent Exhibition in Fairmount Park was reopened on the 10th, the anniversary of the opening of the Centennial Exhibition in the same building. Appropriate ceremonies were observed, and an address was delivered by Col. John W. Forney.

Deadening Noises of Workshops.—To those who carry on any operations requiring much hammering or pounding, the following, from the *Workshop Companion*, will be a great relief: 1. Rubber cushions under the legs of the work-bench. *Chambers' Journal* describes a factory where the hammering of fifty coppersmiths was scarcely audible in the room below, their benches having under each leg a rubber cushion. 2. Kegs of sand or sawdust applied in the same way. A few inches of sand or sawdust is first poured into each keg; on this is laid a board or block, upon which the leg rests, and around the leg and block is poured fine dry sand or sawdust. Not only all noise, but all vibration and shock are prevented, and an ordinary anvil so mounted may be used in a dwelling house without annoying the inhabitants. To amateurs, whose workshops are usually located in dwelling houses, this device affords a cheap and simple relief from a very great annoyance.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, May 12, 1880.

The past week has been one of activity in financial circles.

The importations of specie and bullion for the week ending May 7 amount to $143,095, including $15,139 gold, $127,896 silver and $60 copper. Since the 1st of January the importations will reach $3,196,828, consisting of $1,242,414 gold, $1,953,335 silver and $1079 brass and copper coin. From the 1st of August, 1879, to May 7, 1880, there has been a total importation of $81,204,490, of which $76,501,695 is gold and $4,702,735 silver.

During the week the ruling rate for call loans in the local market has been 5 %. Exceptional loans were made as high as 6 %, and as low as 3 %.

Government bonds have been strong, and there has been a fractional advance in prices. The Treasury purchases for the sinking fund amounted to $3,000,000, the total offerings aggregating $8,784,500.

Railroad investments have been firm, and speculative bonds have been lower, the largest decline being in Boston, Hartford and Erie firsts.

The stock market was weak, and prices declined ½ @ 9 % until Friday. On that day an advance occurred, which reached its highest point on Saturday. After that the market again became weak, and there was a decline of 1 @ 9 %. To-day the market was more settled than it had been for several days, and it continued very strong until the close, with a general advance in prices. The principal dealings to-day were in the coal shares, Erie, Kansas and Texas, Lake Shore, Pacific Mail, Wabash and Pacific, Iron Mountain and Western Union Telegraph.

The bank return shows a gain of $2,790,400 in surplus reserve, which now stands at $6,067,850, against $16,088,000 at this time last year, and $15,822,000 at the corresponding period in 1878. The loans show a gain this week of $701,400, the specie is up $3,985,000, the legal tenders are increased $243,100, the deposits other than United States are up $5,750,800, and the circulation is decreased $73,300.

The following is an analysis of the bank totals of this week compared with that of last week

	May 1.	May 8.	Comparisons.	
Loans	$280,436,300	$281,137,700	Inc.	$701,400
Specie	49,406,500	53,391,500	Inc.	3,985,000
Legal t'nd'rs	17,014,000	17,257,100	Inc.	243,100
Tot. reserve.	66,420,500	70,648,600	Inc.	4,228,100
Deposits	252,572,200	258,323,000	Inc.	5,750,800
Reserve required	63,143,050	60,580,750	Inc.	1,437,700
Surplus	3,277,450	6,067,850	Inc.	2,790,400
Circulation	20,646,200	20,572,900	Dec.	73,300

The foreign trade movements at the port of New York since our last issue are shown in the following tables:

IMPORTS

For the week ended May 8:

	1878.	1879.	1880.
Dry goods	$1,182,044	$1,250,991	$1,875,502
General mdse	4,133,329	4,975,766	9,996,860
Total for week.	$5,316,273	$6,226,757	$11,872,362
Prev. reported	96,984,963	102,838,451	168,730,951
Since Jan. 1	$103,301,236	$109,065,208	$180,603,313

Included in the imports were items of merchandise valued as follows:

	Quantity.	Value.
Anvils	1	$22
Brass goods	24	2,222
Bronzes	20	4,625
Chains and anchors	179	6,829
Copper		3,597
Cutlery	191	39,115
Guns	138	30,024
Hardware	74	1,070
Iron, hoop, tons	1,283	55,450
Iron, pig, tons	13,867	300,388
Iron, sheet, tons	182	12,503
Railroad bars	23,420	160,401
Iron ore, tons	4,742	15,044
Iron, other, tons	22,284	643,126
Lead, pigs	2,335	13,154
Metal goods	239	17,861
Nails	9	730
Needles	41	8,569
Nickel	6	2,472
Old metal		9,718
Platina	1	2,823
Percussion caps	74	6,287
Saddlery	62	12,241
Steel	27,502	191,899
Spelter	232,250	11,309
Silverware	5	479
Tin, bxs	51,909	338,143
Tin, 2,605 slabs; lbs., 193,772		46,600
Wire	3,526	25,484
Zinc	166,191	9,393

EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended May 11:

	1878.	1879.	1880.
For the week	$6,830,957	$6,080,721	$7,704,922
Prev. reported	113,502,955	103,437,192	116,923,265
Since Jan. 1	$120,333,912	$109,517,913	$124,628,187

EXPORTS OF SPECIE.

For week ended May 8:

Total for the week	$127,863
Previously reported	3,220,585
Total since January 1	$3,348,448

Government bonds at the close were strong at the following quotations:

	Bid.	Asked.
U. S. 6's 1880 registered	104⅛	104¾
U. S. 5's 1880 coupon	104⅛	104¾
U. S. 6's 1881 registered	106⅛	106⅝
U. S. 6's 1881 coupon	106⅛	106⅝
U. S. 5's 1881 registered	102⅞	103⅛
U. S. 5's 1881 coupon	102⅞	103
U. S. 4½'s 1891 registered	107¼	108
U. S. 4½'s 1891 coupon	109	109⅛
U. S. 4's 1907 registered	107⅛	107¼
U. S. 4's 1907 coupon	107⅛	107¼
U. S. Currency 6's 1895	125	—
U. S. Currency 6s 1896	125	—
U. S. Currency 6s 1897	125	—
U. S. Currency 6s 1898	125	—
U. S. Currency 6s 1899	125	—

The following were the closing quotations of active shares:

	Bid.	Asked.
American District Telegraph	80¼	80½
Atlantic and Pacific Telegraph	40½	41½
Boston Water Power	8¼	8¾
Burlington and Quincy	121	122
Bur., Cedar Rapids & North	61	65
Canada Southern	56	56½
Central Arizona	4½	4½
Caribou	2¼	2½
Col., Chicago and Indiana Central	11	11½
Clev., Col., Cin. and Indianapolis	73¼	74
Climax	2¼	2⅝
Chicago, St. Paul and Minn	50	51
Chicago and Alton	107	107½
" Pref.	120	124
Chesapeake and Ohio	16	16½
" " 2d Pref.	17¼	19
Chicago, St. Louis and New Orleans	26	26½
Central Pacific	63	65
Delaware, Lack. and Western	79¼	79⅜
Delaware & Hudson Canal	73¾	74
Express—Adams	112	114
" American	55	56
" United States	44	46
" Wells, Fargo & Co.	105	106
Erie	37	37⅛
" Pref.	59⅜	60
Hannibal and St. Joseph	27¾	28
" " Pref.	69	69¼
Homestake	33	34
Houston and Texas	56	58
Illinois Central	103	103½
Indiana, Bloom. and Western	26	30
Kansas and Texas	33	33¼
Keokuk and Des Moines	7	9
" " Pref.	25	—
Lake Shore	103⅜	103½
Lake Erie and Western	24⅞	25⅛
Little Pittsburgh	6¾	7
Louisville and Nashville	124½	—
Mariette and Cincinnati Pref	7	8
" 2d Pref.	5	5½
Metropolitan Elevated	92½	93
Michigan Central	81¼	81¾
Morris and Essex	105	106
Mobile and Ohio	14½	15
Manhattan Railway	28¼	28¾
Montauk Gas Coal	35	50
Nashville and Chattanooga	69½	69¾
New York Central	126¼	126¾
New York Elevated	113	114
New Jersey Central	69⅜	69½
New Central Coal	24	25
Northwest	90¾	91
" Pref.	108¾	109
Northern Pacific	22½	23
" Pref.	44⅞	45
Ohio and Mississippi	27⅞	28
" " Pref.	72⅜	73½
Ohio Central	17¾	18
Ontario and Western	28¼	28½
Pacific Mail	36⅞	37
Quicksilver	10	11
" Pref.	—	58
Reading	48¾	48½
Rock Island and Pacific	184	190
Silver Cliff	4	4½
St. Louis and Iron Mountain	43¾	43¾
St. Louis and San Francisco	31	33
" " Pref	41½	43
" " 1st Pref.	64	65
St. Paul	74⅜	74⅞
" Pref.	100¾	101
St. Paul and Sioux City	38¾	39¾
" " Preferred	72	74
Standard	28	29
Sutro Tunnel	1⅝	1¾
Union Pacific	84½	84¾
Wabash and Pacific	32¾	32⅞
" Pref.	62⅜	62½
Western Union Telegraph	101½	101⅝

GENERAL HARDWARE.

The jobbing Hardware trade generally report some improvement in business, but from the manufacturers' standpoint the market rules dull, and this is likely to be the condition of affairs until stocks in second hands are reduced. Regarding values, the tone of the market is steady, and if any reductions from published rates are being made it is done in a very quiet manner, the aim of the trade being to hold the prices established for this season until its close. It is obvious, however, that unless, from some cause that seems very improbable at present, the value of iron should again tend upward, it will be impossible to maintain the ruling rates on some classes of Wrought and Cast Iron Hardware.

The demand for Nails is light, and the business, owing to the pressure of speculative lots, is not satisfactory in the matter of prices. We learn by telegraph that the Western Nail Association held a meeting in Pittsburgh to-day, at which the card rate was reduced to a $3.25 basis and provision made for further curtailment of production.

The price of 10d. to 60d. in this market is nominally $4.15 @ $4.25, according to quantity, but we do not think a buyer would have much difficulty in placing an order considerably below the figures quoted above.

W. E. Cutshaw, City Engineer, Richmond, Va., advertises on the opposite page for proposals for furnishing hydraulic pumping machinery, cast iron water pipes, &c. In the advertisement further particulars regarding the proposed work will be found.

P. R. Dunne, manufacturer of Torrey's Patent Ice Cream Freezers, quotes these goods at the following list, which is subject to discount 33⅓ per cent.:

TORREY'S PATENT FREEZER.

Arctic.		Cog Wheel.	
1 quart	$1.50	3 quarts	$3.50
2 "	2.25	4 "	4.25
3 "	3.00	6 "	5.25
4 "	3.75	8 "	8.00
6 "	5.00	10 "	9.00
8 "	6.00	15 "	12.00
14 "	9.00		
23 "	12.00		

Abraham Bussing, secretary of the Ausable Horse Nail Company, has been appointed agent for Shoenberger's Patent Toe Calks, a stock of which will be found at his warehouse, No. 4 Warren street. The prong in this Calk is set back from the end, so that it does not drive in the crease, thereby weakening the Shoe. We invite attention to his advertisement on the 26th page.

We have received the following notices:

NEW YORK, May 10, 1880.

A meeting of the Norway Carriage Bolt Makers' Association of the United States was held at the Astor House, in this city, on the 5th instant, every manufacturer being represented.

The following resolution was presented:

Resolved, That the present cost of importing Norway Iron is too great and the value of labor too high, to warrant any reduction in the price of Norway Iron Carriage Bolts, and that it is the sense of this meeting that discounts to the trade remain as last quoted.

There being no discussion, the resolution was put to the house and carried unanimously. GEORGE H. LEA, Secretary.

NEW HAVEN, CONN., May 7, 1880.

At a meeting of the Carriage Hardware Manufacturers' Association, held in this city on the 28th ult., the following preamble and resolution was unanimously passed:

Whereas, The prices of Carriage makers' Hardware not having been advanced in proportion to the increased cost of iron or other products thereof,

Resolved, That we maintain the present prices made January 20, 1880.

R. P. COWLES, Secretary.

NEW YORK, May 10, 1880.

At a meeting of the Sash Weight Manufacturers of this city and vicinity, held this day, it was agreed to reduce production for the next 30 days 25 per cent., and the former prices were confirmed as follows: In 500-lb. lots or more, 2½ cents per lb., net. For all Dumb Waiter and Extra Size Sash Weights, ½ cent. per lb. advance over the above prices. Terms, net cash, 30 days. Regular Standard Sizes to run from 2 to 30 lbs.

JOHN G. PRICE, Chairman Committee.

C. N. Marcellus & Co., No. 91 Liberty street, have been appointed Agents of the Crockford Mfg. Co., of Newark, N. J., manufacturers of Crockford's Common and Ratchet Braces and Extension Bits.

The following circular has just been issued from the office of Hoopes & Townsend:

PHILADELPHIA, May 12, 1880.

The firm of Hoopes & Townsend was dissolved on 23d January, 1879, by the death of S. Sharpless Townsend. The undersigned surviving partner, having purchased the interest of the estate, will continue the business under the same firm name.

BARTON HOOPES.

Messrs. Clement R. Hoopes and Barton Hoopes, Jr., are admitted to an interest in the business, and Mr. James M. Hibbs, who has been long connected with the firm, is appointed to the position of business manager.

Carr, Crawley & Devlin, proprietors of Philadelphia Hardware and Malleable Iron Works, have just issued a handsome catalogue and price list, in which they illustrate the large assortment of Builders', Saddlery and other Hardware manufactured by them. The book contains 270 pages, is printed on heavy tinted paper, and is substantially bound in cloth. Graham & Haines are their agents in this city. They have also issued, under date of 1st instant, a revised discount sheet, which we print below. In addition to the discounts quoted, an extra discount of 10 per cent. for cash is allowed:

	Dis. per cent.
Bronze Metal Butts, No. 105	55
Bronzed Butts, No. 100	55
Loose Pin, No. 53	55
" No. 30	30
" No. 16	25
" No. 17	30
" No. 15	30
Narrow Fast, Drilled, No. 65	10
" Loose, " No. 70	25
Broad Fast, " No. 75	20
" Loose, " No. 80	25
Mayer's Hinges, Drilled	25
Parliament Hinges, Drilled, No. 90	25
Wrought Iron Inside Blind Hinges, polished, No. 110	30
Wrought Iron Inside Blind Hinges, bronzed, No. 110	60
Wrought Iron Narrow Fast Butts, No. 115	30
" Back Flaps, No. 120	30
" Table Hinges, No. 125	30
" Back Flaps, No. 130	30
Lull & Porter's Patent Hinges	55
Gate Hinges	50
Gate Latches	50
Porch Post Supporters	50
" " " in bulk	15
Barn Door Hangers, No. 4	33⅓
" " " 2	33⅓
" " " 1	33⅓
" " " 5	33⅓
" " " 3	33⅓
" " " 6	33⅓
" Rollers	10
" Rail	50
Bell Pulleys	25
Frame Pulleys	33⅓
Axle Pulleys	33⅓
Screw Pulleys	20
Side Pulleys	20
Upright Pulleys	20
Dumb Waiter Pulleys	30
Awning Pulleys	30
Clothes Line Pulleys	30
Sliding Door Sheaves	40
" Rail	15
Chain Door Fasteners	40
Barrel, Tower and Shutter Bolts	25
Shutter Bolts, No. 20	45
" No. 24	42½
" No. 25	35
Spring Bolts	0
Barrel "	40
Square Spring Bolts	40
Necked Bolts	0
Bottom "	40
Spring "	40
Staples for Bolts	50
Chain Bolts	30
Thumb Latches, Nos. 1 to 4	10
" Nos. 10 to 114	0
Drop Latches	35
Store Door Latches	10
"	10
Barn Door Latches	15
Shutter Bowers	20
" Stays	33⅓
" Stay Rosettes	20
Lamp Hooks	40
Picture Hooks	40
Awning Hooks	40
Shutter Fasteners	40
" Hooks	0
Wardrobe Hooks	30
Hat and Coat Hooks	37½
Gum Spring Hooks	10
School House Hooks	30
Head Board Hooks and Eyes	40
Harness Hooks	15
Ceiling Hooks	30
Clothes Line Hooks	20
Bird Cage Hooks	45
Hat Rack Plates and Hooks	30
Flush Chest Handles	40
Wrought Chest Handles	40
Surface Chest Handles	40
Drawer Pulls	30
French Window Catches	0
Cupboard Catches	0
Cupboard Knobs	20
Shutter Bars	20
Sash Lifts	20
Sash Fasteners	0
Sash Props	0
Stubs and Plates	50
Transom Plates	50
Shutter Lifts	25
Shutter Screws	10
Sash Rollers	10
Chest Rollers	10
Fence Staples	50
Hinge Hasps	15
Saw Rods	20
Knockers	10
Door Buttons	10
" on Plates	25
Ventilators	20
Stay Nails	25
Plumb Bobs	20
Sheave Wheels	40
Drawer Pulls	50
Door Pulls	40
Table Leaf Supports	40
Cloth Clamps	0
Quilting Frame Clamps	35
Oar Locks	20
Rudder Braces	20
Cleats	25
Tackle Blocks	25
Thimbles	20
Awning Frame Plates	25
Hatch Rope Eyes	25
Rings	25
Plate Casters, with Iron or Brass Wheels	20
" Wood Wheels	25
" Porcelain Wheels	25
Piano Casters	10
Socket Casters	10
French Casters	30
Bed Casters, with Iron Wheels	20
" " Wood Wheels	25
" " Porcelain Wheels	25
" " Globe Wheels	10
Bracket Casters	10
Box Casters	10
Truck Wheels	40
Bed Keys	40
Bedstead Fasteners	20
Tobacco Cutters	30
Shade Brackets	55
Roller Ends	55
Shade Cord Holders	55
Shade Racks	55
Soap Cuts	10
Spittoons	10
Foot Scrapers	10
Grindstone Fixtures	33⅓
Friction Rollers	10
Gridirons	15
Cork Pressers	33⅓
Hammers	0
Sad Iron Stands	33⅓
Coffee Pot Stands	33⅓
Lemon Squeezers	20
Boot Jacks	30
Foot Rests	20
Dumb Bells	25
Quoits	20
Well Wheels	20
Melting Ladles	10
Hay Fork Pulleys	25
Ox Balls	25
Umbrella Stands	20
Druggists Brackets	50
Brackets	25
"	25
"	60
"	25
Saddlery Hardware	5
Hame Fasteners	25
Carriage and Coach Hinges	10
Carriage Door Dovetails	10
Lazy Back Irons	5
Jump Seat Irons	15
Yoke and Swingletree Tips	33⅓
Shaft and Pole Tips	33⅓
Screw Clamps	5
Top Props	25
Top Prop Nuts and Rivets	25
Apron Hooks and Rings	20
Back Stays and Seat Scrolls	0
Carriage Bands (pages 195 197)	37½
" (pages 198-201)	25
Malleable Iron Castings, 10 cents per pound	0
Wrought Iron Felloe Plates, 11 cents per pound	0
Malleable Iron Castings	0
Thornley's Washers	0
Cast Iron Washers	0
Spring Shackles	10
Trunk Dovetails	33⅓
" Plates, Malleable	33⅓
" " Wrought	33⅓
" Rollers	33⅓
" Hinges	33⅓
" Handle Caps	33⅓
" Buttons	33⅓
" Handle Loops	33⅓
Sauce Pan Handles	20
Lid Knobs	0
Wrought Iron Ears	30
Malleable Iron Ears	0
Coal Hod Handles and Ears	0
Dish Pan Handles	0
Stove Pipe Dampers	40
Coal Shovels	30
Roofin Groovers	0
Castings for Tin and Sheet Iron Workers	0
Tea Pot Handles	0

David Block, manufacturer of Plain and Japanned Tinware, &c., has removed his warehouse and factory to the large premises Nos. 65 and 67 Bayard street. We invite attention to his advertisement on the 31st page, in which he illustrates some of his specialties.

W. K. Ross, No. 97 Chambers street, illustrates, in an advertisement on the 19th page, the "Nail City" Lantern. This Lantern is provided with two globes, the inner one being a regular No. 1 Sun Chimney, the outer an ordinary Lantern Globe, both of which can be obtained, in case of breaking, in almost any country store. The Lantern opens easily for lighting and filling, and the manufacturers claim that the flame is always steady and will not be extinguished in a strong wind. We invite attention to the advertisement referred to.

BRITISH IRON MARKET.

[*Special Report by Cable to The Iron Age.*]

LONDON, Wednesday, May 12, 1880.

Scotch Pig.—The market is dull and prices are weak. Our quotations show a slight reduction on last week's figures, Gartsherrie being 1/6 lower, Eglinton, 1/, and Coltness, 6d. The following are to-day's quotations:

Gartsherrie	53/6
Coltness	57/
Glengarnock	54/
Eglinton	49/

Manufactured Iron.—There is no improvement to note, the market remaining dull, with prices nominal. We repeat quotation: Best Staffordshire Bars, £9.

Steel Rails.—There is very little doing. We quote, for ordinary sections, £7. 10/ @ £8, nominally.

Iron Rails.—Business continues light, with a continued tendency toward lower prices. We reduce quotations this week 5/, quoting Welsh, £6 @ £6. 10/.

Old Rails.—The offerings are moderate and stocks small. There is no demand, however, and prices are weak. We reduce quotations for Old T's to £4.

Scrap—Nothing doing.

IRON.

American Pig.—There is little, if any, change to note in the condition of the market this week; the demand is inactive. Some of the strong Lehigh companies decline to quote prices at present, and are practically out of the market for the time being. We hear of several furnaces preparing to blow out, and it is reported that this movement will be followed by many others. We quote, nominally, Foundry No. 1, $26 @ $28; Foundry No. 2, $25 @ $27; Gray Forge, $25.

Scotch Pig.—The market is in a very unsettled condition, and sales have been made during the week at prices much lower than our quotations, but as these were, in most instances, lots forced for realization, they do not fairly represent the value of the Iron to-day. The business in Scotch Pig since Wednesday last will aggregate about 3000 tons of various brands. Gartsherrie has sold pretty freely at $22, but this is said to be below the cost of the Iron at the time it was imported. Freights are now much lower than they have been in a long time. We quote: Eglinton, $21 @ $22; Glengarnock and Gartsherrie, $22 @ $23; Coltness, $24 @ $24.50.

Rails.—No new business is reported, and we quote, nominally: Steel, $65 @ $70; and Iron Rails, $55 @ $60.

Old Rails.—The business in Old Rails continues light, and the stocks here and to arrive are very large. Sales aggregating about 1000 tons, at $25, are reported. The nominal quotation is $26 @ $27. But we hear of D. H. being offered at $25, from store.

Scrap.—We have not heard of a single transaction in Wrought Scrap since our last writing, and stocks here are large and steadily accumulating. We quote No. 1 Wrought, from yard, $27 @ $28, nominally.

Manufactured Iron.—From store there is a fair demand, but the tone of the market since the heavy decline in the West is weak and unsettled. We quote: Common Bars, 2.8¢; and Refined, 3¢, in a small way. For large orders these figures could be shaded.

METALS.

Copper.—The market for Lake Superior Copper has been very quiet, sales aggregating 300,000 to 400,000 lbs., from dealers' and speculators' hands only, at prices ranging from 20¢ down to 19½¢, also the closing figure and nominally that of Baltimore. The companies do not sell at above prices, being content to hold off until outside lots are disposed of, especially as manufacturers carry an ample supply. From England very low prices are cabled—£66 for Best Selected and £57 for Chili Bars. The decline experienced by the latter since the highest previous point was reached has, therefore, been upward of 22 per cent. Nor is this at all surprising when we come to consider that the large Spanish production is as much an unexpected event of the past few years in Copper, as the enormous Australian Tin production was ten years ago to the Tin trade. Spanish production has simply begun to revolutionize the Copper trade, for without some such extraordinary cause, Copper could hardly have receded as fast as it has done this year, even granting that the absence of speculation and the disappointments growing out of the poor spring trade in Europe were bound to produce a downward tendency. Nothing of special interest has occurred on the West Coast; meanwhile, Chili is earning golden opinions by the manner in which she deals with the Peruvian bondholders in England, and when the war shall have come to a close Chili will no doubt attract large amounts of capital from abroad ready to give fresh impulse to her vast mineral resources, including Copper. Manufactures of Copper remain at the following rates: Braziers', 31¢ @ 37¢; Circles, 34¢ @ 37¢; Segment Sheets, 34¢; Locomotive Fire-box Sheets, 31¢; Sheathing Copper, 29¢; and Bolts, 31¢.

Tin.—Our market has remained quiet and lifeless since our last, and, besides the ordinary jobbing trade, a sale of spot Straits has been made at 17¼¢. We quote at the close large lines, Straits, 17½¢; English Refined, none here; do. Common, 17¾¢; Billiton, 16½¢; Australian, 17½¢, and Banca, 20½¢, nominally. Europe and the East are drooping as fast as we do; Singapore now cables $23.50 per picul, and London £76 for Straits. The English decline has, therefore, been something like 25 % from the highest previous point. The imports during the week have been 9000 slabs Straits and 2115 slabs Australian. *Tin Plates* have behaved well during the week. The buying has commenced here, leading to quite an extensive business, the announcement of which has immediately reacted on the English market, where cokes are now quoted 18/6 @ 20/. The men in Wales are reported by cable to be insisting on a reduction of make, in accordance with previous agreements on the part of the makers. We quote at the close, large lines, ordinary brands, per box: Charcoal Bright, $7.75 @ $8; do. Ternes, $7 @ $7.25; Coke Tin, $5.87½ @ $6; and do. Ternes (scarce), $5.75 @ $6.

Lead.—Although Ore at Leadville is represented to be scarce and high in price, this has no effect here; on the contrary, the market has been getting into a worse condition daily, being excessively dull, with little or nothing doing. Parties here have offered small lots of Lead at 4¾¢, and quotations now range from 4¾¢ @ 5¢, nominally. The principal holders have withdrawn. Nothing transpires in Refined either, which we nominally quote 5¼¢ @ 5½¢. Manufactures are as follows: Sheet Lead, 8½¢; Lead Pipe, 8¢; Tin-lined Lead Pipe, 15¢, and Block Tin Pipe 40¢ ₱ lb, less the usual trade discount.

Spelter and Zinc.—Unbroken dullness prevails, nor can there be any dealings reported. Common Domestic is quoted, nominally, 5⅞¢ @ 6¢, and Silesian, 6⅛¢ @ 6½¢, according to brand. Sheet Zinc is worth 7¾¢.

Nickel.—Remains unaltered at $1.50.

Antimony.—The stocks are light, the deliveries are behindhand and absorbed as rapidly as they arrive, leaving the market in a good position, with a steady amount of activity. Cookson at 21½¢ @ 22¢, and Hallet at 18¢.

OLD METALS, PAPER STOCK, &c.

These markets are very dull. No one is buying stock, and in some cases it would be impossible even to force a sale. In the absence of business our quotations are merely nominal.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy	₱ lb.	$0.17	@ .....
Copper Bottoms	"	.14½	@ $0.15
Yellow Metal	"	.09	@ .....
Brass, heavy	"	.11	@ .12
Brass, light	"	.08	@ .09
Composition, heavy	"	.11	@ .12
Lead, heavy	"	.04½	@ .04¾
Tea Lead	"	.04	@ .04½
Zinc	"	.04½	@ .04¾
Pewter, No. 1	"	.14	@ .15
Pewter	"	.11	@ .12

Deadening Noises of Workshops.—To those who carry on any operations requiring much hammering or pounding, the following, from the *Workshop Companion*, will be a great relief: 1. Rubber cushions under the legs of the work-bench. *Chambers' Journal* describes a factory where the hammering of fifty coppersmiths was scarcely audible in the room below, their benches having under each leg a rubber cushion. 2. Kegs of sand or sawdust applied in the same way. A few inches of sand or sawdust is first poured into each keg; on this is laid a board or block, upon which the leg rests, and around the leg and block is poured fine dry sand or sawdust. Not only all noise, but all vibration and shock are prevented, and an ordinary anvil so mounted may be used in a dwelling house without annoying the inhabitants. To amateurs, whose workshops are usually located in dwelling houses, this device affords a cheap and simple relief from a very great annoyance.

Special Notices.

A LARGE ASSORTMENT
OF
New and Second-Hand Machinery.

STEAM ENGINE MACHINERY.

One Delamater Sugar-house Engine 26 in.x48 in.
One Corliss 40 horse power, 10 in.x24 in.
Five Horizontal Engines, new 9 in.x16 in.
Four " " 8 in.x12 in.
One Portable Engine, 5 horse power.
One Horizontal Engine, 11 in. x 18 in,, Whitehall & Hampsen.
One Upright Engine. 16 in.x16 in. [ferty.
One Horizontal Engine, 15½ in.x30 in., Todd & Raf-
One Upright Engine, 7½ in.x10 in.
One " " and Boiler complete, 5 H P.
One 25 h. p. Horizontal Engine and Upright Boiler.
One Boiler, 5 ft.x15 ft. 83 3 in. Tubes.
Two " 5 ft.x14½ ft 100 2¾ in. Tubes.

MACHINISTS' TOOLS.

One Gear Cutter and Milling Machine combined (new.)
One Vertical Boring Mill, bore from 26 to 90 inches.
One Shaper, 6-inch stroke. [columns
One Turn Table and Boring Mill, 11 feet between
Two Slabbing Machines.
One Lathe, 18 in. x 8 ft., Screw Cutting.
One " 14 in. x 5 ft., " "
One Merrill Compressed Air Hammer, Hotchkiss Patent.
One Punch and Shears combined, will punch 1¼-inch hole in 1-inch iron in the center 30 in.
One large Shears, will cut ¾ iron any size.
Two Ensley Drills.
One New Haven Mach. Co. Drill, will bore in center 60 in.
One New Haven Mach. Co. Drill, will bore in center 30 in.
One New Haven Planer, 37 in. x 9 ft.
7900 lbs. ¾ Plate iron, for safes.
One Lathe, 32 in.x20 ft. bed.
One " 28 in.x20 ft. "
One " 16 in x 7 ft. "
One Pattern Makers' Lathe.
One Planer, 42 in.x16 ft.
One " 20 in.x6 ft.
One " 24 in x5 ft.
One Crank Planer, 18 in.x2 ft.
One Travis' Boring Machine.
Eighteen Drilling Machines.
One Root Blower.
One Bogardus Mill, No. 5.
One Pair Hand Shears, Pond's Patent.
One Large Power Punch for bridge work.
One 3000 ton Hydraulic Press and Pump.
One Dudgeon Beam Punch.
One Upright Drill, to the center of 61 in.
One " " " " " " " 42 in.
One Hand Punch to the center of 36 in.
One " " smaller.
One hundred Vices.

PUMPS.

One Knowles Special Pump, No. 7.
One Woodward Steam Pump, No. 4.
One Guild & Garrison Steam Pump, No. 3.
One Woodward Steam Pump, No. 1.

J. GRAY'S MACHINERY DEPOT
37 Dey Street, New York, U. S. A.

FOR SALE.

A perfectly assorted lot of Machinery for making Horse Nails by patented process, or will join capitalists in forming company. The cheapest and best. Address H. D. COWLES,
Merchants' Hotel, New York.

For Sale.

The best Retail Hardware stock and stand in Kansas City. Is doing a good business. Present stock about $25,000. Such an opportunity as this, for a couple of active, hard-working young men, with $20,000 or $30,000 capital, is seldom offered.
Address J. E. FORBES & CO.,
Kansas City, Mo.

SALESMAN WANTED.

A firm manufacturing a large line of Builders' Hardware, want a salesman well acquainted with the retail trade in New York City and vicinity.
Address, giving reference, H. R. L.,
Office of *The Iron Age*, 83 Reade St., New York.

SCHOOL OF
MECHANICAL ENGINEERING.
Richards & Dole, Springfield, Mass.

To those desiring to become skillful Draughtsmen and Engineers, the course of instruction offers important advantages, as it includes all the training comprised in learning a trade, as well as a sound education in Mechanics and Engineering.

TO COAL AND IRON MEN.—The best bed of Bituminous Coal for Coke or Forge work east of Allegheny Mountains for lease to responsible parties. Five ft. vein now open. Situated near P. & E. R. R. in Clinton Co., Pa. The following analyses made April 17th, by State Assayer:

	No. 1.	No. 2.
Water, 224 deg.	1.000	.326
Volatile matter	1.467	.700
Fixed carbon	91.405	86.090
Sulphur	2.038	1.775
Ash	4.090	11 050
	100.000	100.000

No. 1 Coke from Lump Coal. No. 2 Coke from Slack Coal. Address J. S. MUNDY, Williamsport, Pa.

SITUATION WANTED—As Cast Steel Roller and Roll turner or Manager, 35 years' experience: satisfactory reference given.
Address JOHN COX,
Bloomingdale, Passaic Co., New Jersey

ILLUSTRATED CATALOGUES
of my Patent
Bit Brace Wrench
are now ready. This tool possesses every advantage of the ordinary Bit Brace, **and will also turn with rapidity Nuts and Bolts from ¼ to 1¼ inches.**
Q. S. BACKUS,
102 Chambers St, New York.

WANTED.—Consignments of small Engines and Boilers, Screw Cutting Foot and Power Lathes, and other desirable tools, at reasonable prices, on commission, by a responsible firm in New York, having a machinery store in first class location. Address P. O. Box 1612, New York City.

Special Notices.

A Woodruff & Beach Beam Engine,

Low pressure, 42-inch cylinder, 84-inch stroke, with fly-wheel pulley 20 feet diameter, 36-inch face, and

Four Tubular Boilers,

60 inches in diameter, 20 feet long, and all connections practically as good as new.
For sale by
The Geo. Place Machinery Agency,
121 Chambers and 103 Reade St.,
NEW YORK.

JOHN R. WHITLEY & CO.,
European Representatives of First-Class American Houses,
WITH
FIRST-CLASS AGENTS
IN THE
Principal Industrial and Agricultural Cities and Centers of Europe.
TERMS ON APPLICATION.
LONDON, 7 Poultry, E. C. PARIS, 8 Place Vendome.

LAMBERSON'S
PRICE BOOKS.
Full Leather, $7.50. Half Leather, $6.50.
Pocket Edition, Full Leather, $3.50.
DISCOUNT Bolt List, $1.50.
Screw List, 50 cents.
Leigh's Discount Book, 50 cents.
Address all orders to *Pope & Stevens,* General Agents, 90 Chambers Street, N. Y.
For sale at publisher's prices by Wm. Blair & Co., Chicago; A. F. Shapleigh & Co., St. Louis; C. B. James, Detroit.

DISCOUNT BOOK,
For *Hardware Buyers,* shows at a glance the *net* of any discount or combination. Also contains *Computing Tables* for quickly and accurately reckoning discounts *without multiplication.* Price, in Leather, $1.00; *in Cloth, 50 cents.*
Address **E. B. LEIGH.**
St. Louis Elevator, St. Louis, Mo.
IVISON, BLAKEMAN, TAYLOR & CO., New York

The Sherman Process Co.
9 Pemberton Square, Boston, Mass.,
Issue Licenses to use the Process for the Manufacture of Iron and Steel
In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces.
The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working
See page 17 of *The Iron Age* of Oct. 25th, 1877.

Just Published.
STEEL:
Its History, Manufacture, Properties, and Uses.
By J. S. JEANS,
Secretary of the Iron and Steel Institute.
Section I. *History of Steel:* Chap. 1. History of Steel; 2. Early History in England; 3. Progress of Invention; 4. History of Bessemer Process; 5. Siemens-Martin Process; 6. Other Steel-making Processes; 7. Steel in America; 8. Germany; 9. France; 10. Austria; 11. Russia; 12. Sweden; 13. Other Countries.—Section II. *Manufacture of Steel:* Chap. 14. Cementation and other Methods; 15. Manufacture by Bessemer Process; 16. Siemens-Martin Process; 17. Other Methods.—Section III. *Chemical and Physical Properties of Steel:* Chap. 18. Phosphorus in Steel; 19. The Use of Manganese; 20. Spiegeleisen; 21. Sulphur in Steel; 22. Silicon in Steel; 23. Tensile Strength of Steel; 24. Mechanical Tests of Steel; 25. Analysis of Steel.—Section IV. *Uses of Steel:* Chap. 26. Application of Steel to Railway Purposes; 27. To Shipbuilding; 28. To Bridge Building; 29. To General Purposes; 30. Guns and Armor Plates; 31. Other Purposes.
Price.....$14.50
For Sale by
DAVID WILLIAMS,
83 Reade St., New York.

FOR SALE,
Job Lots and Bankrupt Stocks Hardware.
Great bargains offered to the trade.
A. W. WHEELER,
141 Lake St., Chicago, Ill.

FOR SALE.
The Stock, Good Will and business of an old established Hardware, Stove, and Implement Store, in a flourishing County Seat of 4000, in Southern Ohio. Stock about $15,000, bought before the late advance. Annual Sales $40,000 to $50,000. Brick building 25 x 200 feet, can be bought or leased. Reason for selling, going into manufacturing business. For particulars address
J. W., Care PAPPENHEIMER HARDWARE Co.,
Cincinnati, Ohio.

WANTED.
Situation as COMPOUNDER, by an experienced and successful compounder in the manufacture of the best grades of Tool and Machinery Steel.
Address COMPOUNDER,
Care of Letter Carrier No. 10,
Cleveland, Ohio.

Wanted.
A Salesman acquainted with Iron, Steel and Hardware trades in the East or West. Address, naming experience and references,
ROLLING MILL,
P. O. Box 1387, New York City.

Bissell & Welles,
Wholesale Hardware Auctioneers,
83 Chambers and 65 Reade Sts., N. Y.
Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and importers.

Wanted.
Two second-hand Milling Machines, No. 2 Lincoln Pattern preferred. Must be in good order.
Address with price
P. O. BOX 37,
New Haven, Conn

Special Notices.

E. S. Wheeler & Co.,
54 CLIFF ST.,
NEW YORK,
OFFER
SPECIAL INDUCEMENTS
IN
QUALITY AND PRICE
IN
English and Scotch Foundry
PIG IRON.

Wanted,
A Pair of Upright Shears for Shearing Plate one-half and three-quarter in. thick.
Address, stating price,
LOCK BOX 893, Pittsburgh, Pa.

FOR SALE.
A works completely equipped for the manufacture of Carriage Axles. Is well located in relation to coal and iron, also very accessible to market.
Address E. P. BULLARD,
14 Dey St., New York.

For Sale.
Stock of Hardware, Stoves, Implements, Tinners' Tools and Stock, in South Western Iowa.
Address Y,
Office of *The Iron Age*, 83 Reade St., New York.

HAMMACHER & DELIUS,
Hamburg, Germany,
62 Alter Wall,
Solicit correspondence with American Manufacturers and Inventors in regard to representation in European countries.

Canadian Mines, Iron, Lead, &c.
Iron, Phosphate, Lead and Gold Mines for sale. Mining properties, ores and minerals bought on commission. Mineral territories prospected.
Address SAMUEL D. MILLS,
Mining Manager, Mineralogist, &c.,
69 Clarence St., Kingston, Ontario, Canada.

Europe.
Matheson & Grant's
Address is
32 Walbrook, London, England.
Engineers and Commission Agents for all business relating to engineering and metals in Europe.
Telegraph address,
MATHESON, WALBROOK, LONDON.

For Sale.
Stock of hardware, stoves and implements, and store furniture, in one of the best towns in Kansas.
Address HARDWARE,
Box 366, Salina, Kansas.

FOR SALE.
100 to 400 Tons 45-lb. T Rail, fit to relay.
A. & P. ROBERTS & CO.,
265 South 4th Street, Phila., Pa.

TO LET.—Two fine Floors, each 25 x 100 feet, with steam power; light on every side; new building, 393 Mulberry St., two minutes from Chestnut St. depot, Pennsylvania R. R., Newark, N. J. Apply to LOWERRE & TUCKER, as above.

Sanderson Bros Steel Co.
A limited number of shares for sale by
EDWARD FRITH & SON,
241 Pearl street, New York

Special Notices.

Reports and Information on all New Inventions and Processes.
Expert Scientific Counsel and testimony in law suits.
Machinery Selected and Tested.
Chemical Analyses and Assays.
Reports on Water Works Machinery a specialty.
PARK BENJAMIN'S SCIENTIFIC EXPERT OFFICE,
37 Park Row, - NEW YORK CITY.

Second-Hand and New
Machinists' Tools.

One Pratt & Whitney 2-spindle Profiling Machine.
One Engine Lathe, 90 in. s. x 20 ft. Ames, new.
One " " 30 in. s. x 20 ft., good order.
One " " 30 in. s. x 16 ft. Wheeler, new.
One " " 30 in. s. x 12 ft. Ames, new.
One " " 30 in. s. x 12 ft.
Two " " 22 in. x 8 ft. Ames, new.
One " " 20 in. s. x 10 ft. Lincoln, new.
Two " " 20 in. s. x 8 ft. Pond, A 1 order.
One " " 18 in. s. x 10 ft. Harrington, A1 order
One " " 16 in. x 6 ft. Wood, Lighte & Co.
One " " 15 in. s. x 6 ft. Wheeler, A1 order.
Six " " 16 in. s. x 7 ft. Ames. new.
Six " " 16 in. s. x 8 ft. " "
One Engine Lathe, 13 in. s. x 4½ ft. Pond, not bk. g. or screw cutting.
One Engine Lathe, 12 in. s. x 4 ft. Pratt & Whitney, not bk. g. or screw cutting.
One Pulley Lathe, 20 in. s. x 6 ft.
Two Hand Lathes, 20 in. s. x 8 ft.
Six " " 11. 14 and 16 in. s. x 4½ to 7 ft. bed.
One 32 in. x 8 ft. Planer. Wood, Lighte & Co., A1.
One 24 in. x 5 ft. Planer.
One 20 in. x 4½ ft, " Putnam.
One 15 in. x 3 ft. "
One Jones & Lamson Screw Machine, No. 1, Aut. Feed.
Two " " " " No. 5, Wire "
One heavy Wood & Light pattern Milling Machine.
Five Lincoln Pattern Milling Machines.
One No. 3 Garvin Milling Machine. New.
One Combined Cutter and Reamer Grinder.
One Radial Drill, A1 order, 40-inch reach.
One 24-in. Drill, self-feed. Ames, new.
One 22-in. " Boynton. New.
Four 20-in. " " "
One 17-in. " Blaisdell, "
One Gear Cutter.
Two Sensitive Drills, drills to 3-16 in. hole.
One Boiler Maker's Combined Punch & Shear. New.
One No. 3 Wilder Punch Press. New. Geared
Three No. 4 " " " "
One No. 6 " Shear Geared. "
One 10 h. p. Baxter Engine. Good as new.
Stephens & Boker Vises, A1 order, 3½ and 4 in.
Belting, Shafting, Pulleys and Miscellaneous
Also can deliver, short notice: [Machinery.
Two " " 22 in. x 10 ft.
Five " " 24 in. x 12 ft.
Six " " 26 in. x 14 ft.

E. P. BULLARD, 14 Dey st., New York.

For Sale.
The valuable Iron Ore property of the Wayne County Mining Company, situated in Wayne Co., N. Y., on the line of Lake Shore division of Rome, Watertown & Ogdensburg R. R., with tracks and branches leading to the mines. This property extends over four miles along said road, and nowhere over half a mile from it, and contains over two millions of tons. It is now in full operation and shipping from 100 to 200 tons per day, and is capable of doubling that amount. It is only 17 miles from port of Genessee, one of the best harbors on Lake Ontario, with ample dock room for shipping by lake. For further particulars, address
J. K. ELLIOTT, Sec'y,
Clinton, Oneida Co., N. Y.

WANTED.
An experienced, practical Miner to take charge of Miners in a Magnetic Iron Ore Mine.
References as to character and qualifications required. Address
H. BURDEN & SONS,
Troy, N. Y.

FOR SALE.
One two-high 18-inch Bar Mill, with housings and pinions of best pattern. Complete; but little used.
One three-high 16-inch Mill, three sets of housings. Complete.
One 1000-pound Watt's Steam Helve Hammer.
Also, a large assortment of Rail Rolls, for 16 and 20-inch Mills. A variety of patterns.
All of above in good condition. For particulars and prices, apply to
MAHONING VALLEY IRON CO.
Youngstown, Ohio.

Iron and Nuts.
"L. W. R. O." Horse Shoe Iron, English Refined Iron, Hoop and Band Iron, Square and Hexagon Nuts. For sale at special prices by
J. O. CARPENTER,
59 John St., New York.

FOR SALE.
Being engaged in mining operations, I will sell my Foundry, Smelting and Metal business on easy terms. This business has been established for many years, and is well known all over the country as producing the best Babbit Metals, Tin Solders, Ingot Brass, &c. Will rent the property low, and the old employees will remain with the purchaser if desired. E. A. C. DU PLAINE,
Firm of Du Plaine & Co., Philadelphia.

Wanted.
A situation, by a competent young man, as Clerk, Salesman, Packer, Porter, or in any capacity where he can be useful. Is familiar with the general hardware trade, and can furnish satisfactory references. Address F. W.,
Office of *The Iron Age* 83 Reade st., New York.

FOR SALE OR LEASE.
The **Right** of the United States of a first-class **Adjustable Chain Pump Bucket,** with self-evident advantages. Can be adjusted to fit the tube, and enlarged in case of wear, hence the pumps can be kept in good working order. Also the entire **Canadian Right** for **sale** or **lease** on royalty. Address,
THOMAS KENYON, Patentee,
Box 123, Hamilton, Ohio, U. S. A.

Special Notices.

The Chattanooga Foundry & Machine Works
Of CHATTANOOGA, TENN.,
WILL BE SOLD
At AUCTION
On the grounds at Chattanooga,
ON SATURDAY, JUNE 19, 1880.

This property comprises 5 acres of the best located real estate in Chattanooga, on which are built 13 buildings, the principal of which are as follows:
The Foundry.—Brick building, corrugated iron roof, 98 feet long by 62½ wide, 2 Cupolas, 15-ton Crane, &c., &c.
The Machine Shop.—Brick building, 150 feet long by 62½ wide, with the most perfect and complete equipment in the Southern States.
Pattern Shop.—Containing complete equipment, patterns for architectural iron work, mill work, blast furnace and mining machinery, stationary and locomotive engines, &c. The stock is very large, of recent construction and adapted to the needs of the country.
The Blacksmith Shop.—Brick building, shingle roof, 60 feet long by 36 feet wide, contains 4 forges and one boiler maker's fire-blast fan and tools complete.
The Boiler Shop.—Frame building, 100 feet long by 36 feet wide, with shingle roof, contains complete equipment with power.
These works, which are by far the best located of any of the iron works of Chattanooga, were established in 1851, and have been in operation with few intervals of idleness ever since. They were burnt down in 1868, and all of the machinery and patterns are therefore of recent date. Architectural iron work, a vast amount of local mill work (the stock of gearing patterns is very large), broad and narrow gauge locomotives and freight cars, the complete equipment of blast furnaces, mining machinery for iron and copper mines, river steamboat engines, blowing engines, boilers and railroad castings have been constructed at these works, and the patterns remain.
These works, which can be started up at any time, have been carefully kept and guarded by watchmen, are located centrally in Chattanooga, which is the center of the coal and iron mining district of East Tennessee, North Carolina and Northern Georgia and Alabama.
The following railroads terminate in Chattanooga, the works having private siding communicating with all of them: East Tennessee, Virginia & Georgia R. R.; Memphis & Charleston R. R.; Western & Atlantic, which also connects at Dalton with the Selma, Rome & Dalton; Nashville & Chattanooga R. R.; Alabama & Great Southern Ry., and the Cincinnati Southern.
The city is already largely engaged in iron manufacture, and is producing iron more cheaply than at any other point in the United States. These works, which have cost over $150,000 to build, will be sold at a great sacrifice, and upon the most reasonable terms. For maps and detailed inventory, apply to **Prof. WM. D. MARKS,** University of Pennsylvania, Philadelphia, or to **W. S. MARSHALL,** Chattanooga, Tenn.

Machine Tools, Engines, &c.,
FOR SALE.
15 in. x 6 ft. Engine Lathe. L. W. Pond.
16 in. x 6 ft. Engine Lathe. New style.
26 in. x 10 ft Engine Lathe. N. Y. S Engine Co.
20 in. x 20 ft. Engine Lathe. Sellers & Co.
13 in. x 6 ft. Fox Lathe. Am. Machine Co.
30 in. x 15 ft. Engine Lathe. English make.
38 in. Column Drill Press.
18 in. Column Drill Press. Fitchburg.
48 in. Bement Car Wheel Borer.
Suspension Drill. Springfield Tool Co.
Large Slotter, 6 ft. swing, 16 in. stroke.
Three Bolt Cutters. 2 in. Pipe Cutter.
Lot Tinsmith Tools.
Engines, Boilers, Steam Pumps.
Power Pumps, Pulsometers, all sizes.
A. G. BROOKS & WINEBRENER,
261 North Third St., Philadelphia.

The Hull Forge Company,
Hull, England,
Roll Flat, Round, Square and Angle
BARS,
and make Steam Hammer
FORGINGS
entirely from Scrap Iron, and can ship direct from Hull to United States. Address
HULL FORGE CO.,
32 Walbrook, London.

---

500 SHARES ($50,000)
Roane Iron Co.'s Stock
FOR SALE.
Rolling Mills and Steel Works at Chattanooga, Blast Furnaces at Rockwood.
This company is entirely out of debt. Have large surplus. Paid regular semi-annual dividends all the time, which are now very large. Best New York, Cleveland or Indianapolis references. S. B. LOWE,
Feb. 28, 1880. Chattanooga, Tenn.

ASTONISHING POWER
IN
PUNCHING & SHEARING PRESSES.
See our illustrated advertisement on next to last page of this paper.
PEERLESS PUNCH AND SHEAR CO.,
52 Dey Street, New York City.

Wanted.
A Rotary Squeezer, suitable for working 200 lbs. Scrap Piles. Address, giving price and terms,
SHELDON & CO.,
Auburn, N. Y.

PROPOSALS.
Bids will be received at Richmond, Va., until the 10th of June next, for furnishing Hydraulic Pumping Machinery and Cast Iron Water Pipes, for laying Water Pipes, for constructing Stone Masonry and for both rock and earth work. Forms of proposals and specifications can be seen by applying to the undersigned.
W. E. CUTSHAW, City Engineer.

Wanted.
A Blast Furnace Manager, first class in every respect, as a manufacturer of Pig Iron (technically and practically), and a good business man; should be from 30 to 45 years of age, with such testimonials as to competency as will insure his fitness. Address COKE,
Office of *The Iron Age*, No. 83 Reade St., N. Y.

WANTED, FOREMAN.
Wanted, Foreman for a Hardware Manufacturing business. Must be a good machinist and manager. Apply by letter to
W. W. HAZZARD,
Room 36, No. 236 Superior St.,
Cleveland, Ohio.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, May 12, 1880.

The past week has been one of activity in financial circles.

The importations of specie and bullion for the week ending May 7 amount to $143,095, including $15,139 gold, $127,896 silver and $60 copper. Since the 1st of January the importations will reach $3,196,828, consisting of $1,242,414 gold, $1,953,335 silver and $1079 brass and copper coin. From the 1st of August, 1879, to May 7, 1880, there has been a total importation of $81,204,490, of which $76,501,695 is gold and $4,702,735 silver.

During the week the ruling rate for call loans in the local market has been 5 %. Exceptional loans were made as high as 6 %, and as low as 3 %.

Government bonds have been strong, and there has been a fractional advance in prices. The Treasury purchases for the sinking fund amounted to $3,000,000, the total offerings aggregating $8,784,500.

Railroad investments have been firm, and speculative bonds have been lower, the largest decline being in Boston, Hartford and Erie firsts.

The stock market was weak, and prices declined ½ @ 9 % until Friday. On that day an advance occurred, which reached its highest point on Saturday. After that the market again became weak, and there was a decline of 1 @ 9 %. To-day the market was more settled than it had been for several days, and it continued very strong until the close, with a general advance in prices. The principal dealings to-day were in the coal shares, Erie, Kansas and Texas, Lake Shore, Pacific Mail, Wabash and Pacific, Iron Mountain and Western Union Telegraph.

The bank return shows a gain of $2,790,400 in surplus reserve, which now stands at $6,067,850, against $16,088,000 at this time last year, and $15,822,000 at the corresponding period in 1878. The loans show a gain this week of $701,400, the specie is up $3,985,000, the legal tenders are increased $243,100, the deposits other than United States are up $5,750,800, and the circulation is decreased $73,300.

The following is an analysis of the bank totals of this week compared with that of last week

	May 1.	May 8.	Comparisons.
Loans.....	$280,436,300	$281,137,700	Inc. $701,400
Specie.....	49,406,500	53,391,500	Inc. 3,985,000
Legal t'nd'rs	17,014,000	17,257,100	Inc. 243,100
Tot. reserve.	66,420,500	70,648,600	Inc. 4,228,100
Deposits.....	252,572,200	258,323,000	Inc. 5,750,800
Reserve required.....	63,143,050	60,580,750	Inc. 1,437,700
Surplus.....	3,277,450	6,067,850	Inc. 2,790,400
Circulation..	20,646,200	20,572,900	Dec. 73,300

The foreign trade movements at the port of New York since our last issue are shown in the following tables:

IMPORTS

For the week ended May 8:

	1878.	1879.	1880.
Dry goods.....	$1,182,044	$1,250,991	$1,875,502
General mdse..	4,133,329	4,975,766	9,996,860
Total for week.	$5,316,273	$6,226,757	$11,872,362
Prev. reported..	96,984,963	102,838,451	168,730,951
Since Jan. 1....	$103,301,236	$109,065,208	$180,603,313

Included in the imports were items of merchandise valued as follows:

	Quantity.	Value.
Anvils	1	$22
Brass goods	24	2,222
Bronzes	20	4,625
Chains and anchors	179	6,829
Copper		3,597
Cutlery	191	39,115
Guns	138	30,024
Hardware	74	1,070
Iron, hoop, tons	1,283	55,450
Iron, pig, tons	13,867	300,388
Iron, sheet, tons	182	12,503
Railroad bars	23,420	160,401
Iron ore, tons	4,742	15,044
Iron, other, tons	22,284	643,126
Lead, pigs	2,335	13,154
Metal goods	239	27,861
Nails	9	730
Needles	41	8,569
Nickel	6	2,472
Old metal		9,718
Platina	1	2,823
Percussion caps	74	6,287
Saddlery	62	12,241
Steel	27,502	191,899
Spelter	222,250	11,309
Silverware	5	479
Tin, bxs	51,909	338,143
Tin, 2,605 slabs; lbs., 193,772		46,600
Wire	3,526	85,484
Zinc	166,191	9,393

EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended May 11:

	1878.	1879.	1880.
For the week...	$6,830,957	$6,080,721	$7,704,922
Prev. reported..	113,502,955	103,437,192	116,923,265
Since Jan. 1....	$120,333,912	$109,517,913	$124,628,187

EXPORTS OF SPECIE.

For week ended May 8:

Total for the week	$127,863
Previously reported	3,220,585
Total since January 1	$3,348,448

Government bonds at the close were strong at the following quotations:

	Bid.	Asked.
U. S. 6's 1880 registered	104½	104¾
U. S. 6's 1880 coupon	104½	104¾
U. S. 6's 1881 registered	106½	106¾
U. S. 6's 1881 coupon	106½	106¾
U. S. 5's 1881 registered	102⅞	103⅛
U. S. 5's 1881 coupon	102⅞	103
U. S. 4½'s 1891 registered	107¾	108
U. S. 4½'s 1891 coupon	109	109½
U. S. 4's 1907 registered	107⅛	107¾
U. S. 4's 1907 coupon	107⅛	107¾
U. S. Currency 6's 1895	125	—
U. S. Currency 6s 1896	125	—
U. S. Currency 6s 1897	125	—
U. S. Currency 6s 1898	125	—
U. S. Currency 6s 1899	125	—

The following were the closing quotations of active shares:

	Bid.	Asked.
American District Telegraph	80¼	80½
Atlantic and Pacific Telegraph	40½	41½
Boston Water Power	8¼	8¾
Burlington and Quincy	121	122
Bur., Cedar Rapids & North	61	65
Canada Southern	56	56½
Central Arizona	4½	4½
Caribou	2¼	2½
Col., Chicago and Indiana Central	11	11½
Clev., Col., Cin. and Indianapolis	73½	74
Climax	2¼	2⅝
Chicago, St. Paul and Minn	50	51
Chicago and Alton	107	107½
" " Pref	120	124
Chesapeake and Ohio	16	16½
" " 2d Pref	17½	19
Chicago, St. Louis and New Orleans	26	26½
Central Pacific	63	65
Delaware, Lack. and Western	79¼	79⅜
Delaware & Hudson Canal	73¼	74
Express—Adams	112	114
" American	55	56
" United States	44	46
" Wells, Fargo & Co	105	106
Erie	37	37⅛
" Pref	59⅝	60
Hannibal and St. Joseph	27¾	28
" " Pref	69	69¼
Homestake	33	34
Houston and Texas	56	58
Illinois Central	103	103½
Indiana, Bloom. and Western	26	30
Kansas and Texas	33	33¼
Keokuk and Des Moines	7	9
" " Pref	25	—
Lake Shore	103⅜	103½
Lake Erie and Western	24⅞	25⅛
Little Pittsburgh	6¾	7
Louisville and Nashville	124½	—
Mariette and Cincinnati Pref	7	8
" " 2d Pref	5	5½
Metropolitan Elevated	92½	93
Michigan Central	81¼	81¾
Morris and Essex	105	106
Mobile and Ohio	14¼	15
Manhattan Railway	28¾	28¾
Montauk Gas Coal	35	50
Nashville and Chattanooga	60½	69¾
New York Central	126¼	126¾
New York Elevated	113	114
New Jersey Central	69⅜	69½
New Central Coal	24	25
Northwest	90¼	91
" Pref	108¾	109
Northern Pacific	22¼	23
" Pref	44⅞	45
Ohio and Mississippi	27⅞	28
" " Pref	72⅜	73½
Ohio Central	17¾	18
Ontario and Western	28¼	28½
Pacific Mail	36⅞	37
Quicksilver	10	11
" Pref	—	58
Reading	48⅛	48½
Rock Island and Pacific	184	190
Silver Cliff	4	4½
St. Louis and Iron Mountain	43⅜	43¾
St. Louis and San Francisco	31	33
" " Pref	41½	43
" " 1st Pref.	64	65
St. Paul	74⅜	74⅞
" Pref	100¾	101
St. Paul and Sioux City	38¼	39¼
" " Preferred	72	74
Standard	28	29
Sutro Tunnel	1⅝	1¾
Union Pacific	84⅛	84¼
Wabash and Pacific	32¼	32⅞
" " Pref	62⅛	62½
Western Union Telegraph	101½	101⅝

GENERAL HARDWARE.

The jobbing Hardware trade generally report some improvement in business, but from the manufacturers' standpoint the market rules dull, and this is likely to be the condition of affairs until stocks in second hands are reduced. Regarding values, the tone of the market is steady, and if any reductions from published rates are being made it is done in a very quiet manner, the aim of the trade being to hold the prices established for this season until its close. It is obvious, however, that unless, from some cause that seems very improbable at present, the value of iron should again tend upward, it will be impossible to maintain the ruling rates on some classes of Wrought and Cast Iron Hardware.

The demand for Nails is light, and the business, owing to the pressure of speculative lots, is not satisfactory in the matter of prices. We learn by telegraph that the Western Nail Association held a meeting in Pittsburgh to-day, at which the card rate was reduced to a $3.25 basis and provision made for further curtailment of production.

The price of 10d. to 60d. in this market is nominally $4.15 @ $4.25, according to quantity, but we do not think a buyer would have much difficulty in placing an order considerably below the figures quoted above.

W. E. Cutshaw, City Engineer, Richmond, Va., advertises on the opposite page for proposals for furnishing hydraulic pumping machinery, cast iron water pipes, &c. In the advertisement further particulars regarding the proposed work will be found.

P. R. Dunne, manufacturer of Torrey's Patent Ice Cream Freezers, quotes these goods at the following list, which is subject to discount 33⅓ per cent.:

TORREY'S PATENT FREEZER.

Arctic.		Cog Wheel.	
1 quart	$1.50	3 quarts	$3.50
2 "	2.25	4 "	4.25
3 "	3.00	6 "	5.25
4 "	3.75	8 "	8.00
6 "	5.00	10 "	9.00
8 "	6.00	15 "	12.00
14 "	9.00		
23 "	12.00		

Abraham Bussing, secretary of the Ausable Horse Nail Company, has been appointed agent for Shoenberger's Patent Toe Calks, a stock of which will be found at his warehouse, No. 4 Warren street. The prong in this Calk is set back from the end, so that it does not drive in the crease, thereby weakening the Shoe. We invite attention to his advertisement on the 26th page.

We have received the following notices:

NEW YORK, May 10, 1880.

A meeting of the Norway Carriage Bolt Makers' Association of the United States was held at the Astor House, in this city, on the 5th instant, every manufacturer being represented.

The following resolution was presented:

Resolved, That the present cost of importing Norway Iron is too great and the value of labor too high, to warrant any reduction in the price of Norway Iron Carriage Bolts, and that it is the sense of this meeting that discounts to the trade remain as last quoted.

There being no discussion, the resolution was put to the house and carried unanimously. GEORGE H. LEA, Secretary.

NEW HAVEN, CONN., May 7, 1880.

At a meeting of the Carriage Hardware Manufacturers' Association, held in this city on the 28th ult., the following preamble and resolution was unanimously passed:

Whereas, The prices of Carriage makers' Hardware not having been advanced in proportion to the increased cost of iron or other products thereof,

Resolved, That we maintain the present prices made January 20, 1880.

R. P. COWLES, Secretary.

NEW YORK, May 10, 1880.

At a meeting of the Sash Weight Manufacturers of this city and vicinity, held this day, it was agreed to reduce production for the next 30 days 25 per cent., and the former prices were confirmed as follows: In 500-lb. lots or more, 2½ cents per lb., net. For all Dumb Waiter and Extra Size Sash Weights, ½ cent. per lb. advance over the above prices. Terms, net cash, 30 days. Regular Standard Sizes to run from 2 to 30 lbs.

JOHN G. PRICE, Chairman Committee.

C. N. Marcellus & Co., No. 91 Liberty street, have been appointed Agents of the Crockford Mfg. Co., of Newark, N. J., manufacturers of Crockford's Common and Ratchet Braces and Extension Bits.

The following circular has just been issued from the office of Hoopes & Townsend:

PHILADELPHIA, May 12, 1880.

The firm of Hoopes & Townsend was dissolved on 23d January, 1879, by the death of S. Sharpless Townsend. The undersigned surviving partner, having purchased the interest of the estate, will continue the business under the same firm name.

BARTON HOOPES.

Messrs. Clement R. Hoopes and Barton Hoopes, Jr., are admitted to an interest in the business, and Mr. James M. Hibbs, who has been long connected with the firm, is appointed to the position of business manager.

Carr, Crawley & Devlin, proprietors of Philadelphia Hardware and Malleable Iron Works, have just issued a handsome catalogue and price list, in which they illustrate the large assortment of Builders', Saddlery and other Hardware manufactured by them. The book contains 270 pages, is printed on heavy tinted paper, and is substantially bound in cloth. Graham & Haines are their agents in this city. They have also issued, under date of 1st instant, a revised discount sheet, which we print below. In addition to the discounts quoted, an extra discount of 10 per cent. for cash is allowed:

	Dis. per cent.
Bronze Metal Butts, No. 105	55
Bronzed Butts, No. 100	55
Loose Pin, No. 53	55
" No. 30	30
" No. 16	25
" No. 17	30
" No. 15	30
Narrow Fast, Drilled, No. 65	10
" Loose, " No. 70	25
Broad Fast, " No. 75	20
" Loose, " No. 80	25
Mayer's Hinges, Drilled	25
Parliament Hinges, Drilled, No. 90	25
Wrought Iron Inside Blind Hinges, polished, No. 110	30
Wrought Iron Inside Blind Hinges, bronzed, No. 110	60
Wrought Iron Narrow Fast Butts, No. 115	30
" Back Flaps, No 120	30
" Table Hinges, No. 125	30
" Back Flaps, No. 130	30
Lull & Porter's Patent Hinges	55
Gate Hinges	50
Gate Latches	50
Porch Post Supporters	50
" " " in bulk	15
Barn Door Hangers, No. 4	33⅓
" " " 2	33⅓
" " " 1	33⅓
" " " 5	33⅓
" " " 3	33⅓
" " " 6	33⅓
" Rollers	10
" Rail	50
Bell Pulleys	25
Frame Pulleys	33⅓
Axle Pulleys	33⅓
Screw Pulleys	20
Side Pulleys	20
Upright Pulleys	20
Dumb Waiter Pulleys	30
Awning Pulleys	30
Clothes Line Pulleys	30
Sliding Door Sheaves	40
" Rail	15
Chain Door Fasteners	40
Barrel, Tower and Shutter Bolts	25
Shutter Bolts, No. 20	45
" No. 24	42½
" No. 25	35
Spring Bolts	0
Barrel "	40
Square Spring Bolts	40
Necked Bolts	0
Bottom "	40
Spring "	40
Staples for Bolts	50
Chain Bolts	30
Thumb Latches, Nos. 1 to 4	10
" Nos. 10 to 114	0
Drop Latches	35
Store Door Latches	10
" "	10
Barn Door Latches	15
Shutter Bowers	20
" Stays	33⅓
" Stay Rosettes	20
Lamp Hooks	40
Picture Hooks	40
Awning Hooks	40
Shutter Fasteners	40
" Hooks	0
Wardrobe Hooks	30
Hat and Coat Hooks	37½
Gum Spring Hooks	10
School House Hooks	30
Head Board Hooks and Eyes	40
Harness Hooks	15
Ceiling Hooks	30
Clothes Line Hooks	20
Bird Cage Hooks	45
Hat Rack Plates and Hooks	30
Flush Chest Handles	40
Wrought Chest Handles	40
Surface Chest Handles	40
Drawer Pulls	30
French Window Catches	0
Cupboard Catches	0
Sash Fasteners	30
Cupboard Knobs	20
Shutter Knobs	20
Shutter Bars	20
Sash Lifts	20
Sash Fasteners	0
Sash Props	0
Stubs and Plates	50
Transom Plates	50
Shutter Lifts	25
Shutter Screws	10
Sash Rollers	10
Chest Rollers	10
Fence Staples	50
Hinge Hasps	15
Saw Rods	20
Knockers	10
Door Buttons	10
" on Plates	25
Ventilators	20
Stay Nails	25
Plumb Bobs	20
Sheave Wheels	40
Drawer Pulls	50
Door Pulls	40
Table Leaf Supports	40
Cloth Clamps	0
Quilting Frame Clamps	35
Oar Locks	20
Rudder Braces	20
Cleats	25
Tackle Blocks	25
Thimbles	20
Awning Frame Plates	25
Hatch Rope Eyes	25
Rings	25
Plate Casters, with Iron or Brass Wheels	20
" Wood Wheels	25
" Porcelain Wheels	25
Piano Casters	10
Socket Casters	10
French Casters	30
Bed Casters, with Iron Wheels	20
" " Wood Wheels	25
" " Porcelain Wheels	25
" " Globe Wheels	10
Bracket Casters	10
Box Casters	10
Truck Wheels	40
Bed Keys	40
Bedstead Fasteners	20
Tobacco Cutters	30
Shade Brackets	55
Roller Ends	55
Shade Cord Holders	55
Shade Racks	55
Soap Cuts	10
Spittoons	10
Foot Scrapers	10
Grindstone Fixtures	33⅓
Friction Rollers	10
Gridirons	15
Cork Pressers	33⅓
Hammers	0
Sad Iron Stands	33⅓
Coffee Pot Stands	33⅓
Lemon Squeezers	20
Boot Jacks	30
Foot Rests	20
Dumb Bells	25
Quoits	20
Well Wheels	20
Melting Ladles	10
Hay Fork Pulleys	25
Ox Balls	25
Umbrella Stands	20
Druggists Brackets	50
Brackets	25
"	25
"	60
"	25
Saddlery Hardware	5
Hame Fasteners	25
Carriage and Coach Hinges	10
Carriage Door Dovetails	10
Lazy Back Irons	5
Jump Seat Irons	15
Yoke and Swingletree Tips	33⅓
Shaft and Pole Tips	33⅓
Screw Clamps	5
Top Props	25
Top Prop Nuts and Rivets	25
Apron Hooks and Rings	20
Back Stays and Seat Scrolls	0
Carriage Bands (pages 195 197)	37½
" (pages 198-201)	25
Malleable Iron Castings, 10 cents per pound	0
Wrought Iron Felloe Plates, 11 cents per pound	0
Malleable Iron Castings	0
Thornley's Washers	0
Cast Iron Washers	0
Spring Shackles	10
Trunk Dovetails	33⅓
" Plates, Malleable	33⅓
" Wrought	33⅓
" Rollers	33⅓
" Hinges	33⅓
" Handle Caps	33⅓
" Buttons	33⅓
" Handle Loops	33⅓
Sauce Pan Handles	20
Lid Knobs	0
Wrought Iron Ears	30
Malleable Iron Ears	0
Coal Hod Handles and Ears	0
Dish Pan Handles	0
Stove Pipe Dampers	40
Coal Shovels	30
Roofin Groovers	0
Castings for Tin and Sheet Iron Workers	0
Tea Pot Handles	0

David Block, manufacturer of Plain and Japanned Tinware, &c., has removed his warehouse and factory to the large premises Nos. 65 and 67 Bayard street. We invite attention to his advertisement on the 31st page, in which he illustrates some of his specialties.

W. K. Ross, No. 97 Chambers street, illustrates, in an advertisement on the 19th page, the "Nail City" Lantern. This Lantern is provided with two globes, the inner one being a regular No. 1 Sun Chimney, the outer an ordinary Lantern Globe, both of which can be obtained, in case of breaking, in almost any country store. The Lantern opens easily for lighting and filling, and the manufacturers claim that the flame is always steady and will not be extinguished in a strong wind. We invite attention to the advertisement referred to.

BRITISH IRON MARKET.

[*Special Report by Cable to The Iron Age.*]

LONDON, Wednesday, May 12, 1880.

Scotch Pig.—The market is dull and prices are weak. Our quotations show a slight reduction on last week's figures, Gartsherrie being 1/6 lower, Eglinton, 1/, and Coltness, 6d. The following are to-day's quotations:

Gartsherrie	53/6
Coltness	57/
Glengarnock	54/
Eglinton	49/

Manufactured Iron.—There is no improvement to note, the market remaining dull, with prices nominal. We repeat quotation: Best Staffordshire Bars, £9.

Steel Rails.—There is very little doing. We quote, for ordinary sections, £7. 10/ @ £8, nominally.

Iron Rails.—Business continues light, with a continued tendency toward lower prices. We reduce quotations this week 5/, quoting Welsh, £6 @ £6. 10/.

Old Rails.—The offerings are moderate and stocks small. There is no demand, however, and prices are weak. We reduce quotations for Old T's to £4.

Scrap—Nothing doing.

IRON.

American Pig.—There is little, if any, change to note in the condition of the market this week; the demand is inactive. Some of the strong Lehigh companies decline to quote prices at present, and are practically out of the market for the time being. We hear of several furnaces preparing to blow out, and it is reported that this movement will be followed by many others. We quote, nominally, Foundry No. 1, $26 @ $28; Foundry No. 2, $25 @ $27; Gray Forge, $25.

Scotch Pig.—The market is in a very unsettled condition, and sales have been made during the week at prices much lower than our quotations, but as these were, in most instances, lots forced for realization, they do not fairly represent the value of the Iron to-day. The business in Scotch Pig since Wednesday last will aggregate about 3000 tons of various brands. Gartsherrie has sold pretty freely at $22, but this is said to be below the cost of the Iron at the time it was imported. Freights are now much lower than they have been in a long time. We quote: Eglinton, $21 @ $22; Glengarnock and Gartsherrie, $22 @ $23; Coltness, $24 @ $24.50.

Rails.—No new business is reported, and we quote, nominally: Steel, $65 @ $70; and Iron Rails, $55 @ $60.

Old Rails.—The business in Old Rails continues light, and the stocks here and to arrive are very large. Sales aggregating about 1000 tons, at $25, are reported. The nominal quotation is $26 @ $27, but we hear of D. H. being offered at $25, from store.

Scrap.—We have not heard of a single transaction in Wrought Scrap since our last writing, and stocks here are large and steadily accumulating. We quote No. 1 Wrought, from yard, $27 @ $28, nominally.

Manufactured Iron.—From store there is a fair demand, but the tone of the market since the heavy decline in the West is weak and unsettled. We quote: Common Bars, 2.8¢; and Refined, 3¢, in a small way. For large orders these figures could be shaded.

METALS.

Copper.—The market for Lake Superior Copper has been very quiet, sales aggregating 300,000 to 400,000 lbs., from dealers' and speculators' hands only, at prices ranging from 20¢ down to 19½¢, also the closing figure and nominally that of Baltimore. The companies do not sell at above prices, being content to hold off until outside lots are disposed of, especially as manufacturers carry an ample supply. From England very low prices are cabled—£66 for Best Selected and £57 for Chili Bars. The decline experienced by the latter since the highest previous point was reached has, therefore, been upward of 22 per cent. Nor is this at all surprising when we come to consider that the large Spanish production is as much an unexpected event of the past few years in Copper, as the enormous Australian Tin production was ten years ago to the Tin trade. Spanish production has simply begun to revolutionize the Copper trade, for without some such extraordinary cause, Copper could hardly have receded as fast as it has done this year, even granting that the absence of speculation and the disappointments growing out of the poor spring trade in Europe were bound to produce a downward tendency. Nothing of special interest has occurred on the West Coast; meanwhile, Chili is earning golden opinions by the manner in which she deals with the Peruvian bondholders in England, and when the war shall have come to a close Chili will no doubt attract large amounts of capital from abroad ready to give fresh impulse to her vast mineral resources, including Copper. Manufactures of Copper remain at the following rates: Braziers', 31¢ @ 37¢; Circles, 34¢ @ 37¢; Segment Sheets, 34¢; Locomotive Fire-box Sheets, 31¢; Sheathing Copper, 29¢; and Bolts, 31¢.

Tin.—Our market has remained quiet and lifeless since our last, and, besides the ordinary jobbing trade, a sale of spot Straits has been made at 17¼¢. We quote at the close large lines, Straits, 17½¢; English Refined, none here; do. Common, 17¾¢; Billiton, 16½¢; Australian, 17¼¢, and Banca, 20½¢, nominally. Europe and the East are drooping as fast as we do; Singapore now cables $23.50 per picul, and London £76 for Straits. The English decline has, therefore, been something like 25 % from the highest previous point. The imports during the week have been 9000 slabs Straits and 2115 slabs Australian. *Tin Plates* have behaved well during the week. The buying has commenced here, leading to quite an extensive business, the announcement of which has immediately reacted on the English market, where cokes are now quoted 18/6 @ 20/. The men in Wales are reported by cable to be insisting on a reduction of make, in accordance with previous agreements on the part of the makers. We quote at the close, large lines, ordinary brands, per box: Charcoal Bright, $7.75 @ $8; do. Ternes, $7 @ $7.25; Coke Tin, $5.87½ @ $6; and do. Ternes (scarce), $5.75 @ $6.

Lead.—Although Ore at Leadville is represented to be scarce and high in price, this has no effect here; on the contrary, the market has been getting into a worse condition daily, being excessively dull, with little or nothing doing. Parties here have offered small lots of Lead at 4¾¢, and quotations now range from 4¾¢ @ 5¢, nominally. The principal holders have withdrawn. Nothing transpires in Refined either, which we nominally quote 5¼¢ @ 5½¢. Manufactures are as follows: Sheet Lead, 8½¢; Lead Pipe, 8¢; Tin-lined Lead Pipe, 15¢, and Block Tin Pipe 40¢ ₩ lb, less the usual trade discount.

Spelter and Zinc.—Unbroken dullness prevails, nor can there be any dealings reported. Common Domestic is quoted, nominally, 5⅞¢ @ 6¢, and Silesian, 6⅛¢ @ 6½¢, according to brand. Sheet Zinc is worth 7¾¢.

Nickel—Remains unaltered at $1.50.

Antimony.—The stocks are light, the deliveries are behindhand and absorbed as rapidly as they arrive, leaving the market in a good position, with a steady amount of activity. Cookson at 21½¢ @ 22¢, and Hallet at 18¢.

OLD METALS, PAPER STOCK, &c.

These markets are very dull. No one is buying stock, and in some cases it would be impossible even to force a sale. In the absence of business our quotations are merely nominal.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy	₩ lb.	$0.17	@	
Copper Bottoms	"	.14½	@	$0.15
Yellow Metal	"	.09	@	
Brass, heavy	"	.11	@	.12
Brass, light	"	.08	@	.09
Composition, heavy	"	.14	@	.15
Lead, heavy	"	.04½	@	.04¾
Tea Lead	"	.04	@	.04½
Zinc	"	.04½	@	.04¾
Pewter, No. 1	"	.21	@	.22
Pewter, No. 2	"	.17	@	.18

Wrought Iron	₱ ton	22.50	@ .....
Light do	"	15.00	@ .....
Stove Plate	"	12.50	@ .....
Machinery do	"	17.50	@ .....
Grate Bars	"	7.50	@ .....

The prices current for Rags, &c., are as follows

Canvas, Linen	₱ lb.	4 c.	@ .....
White Cotton, New	"	4 c.	@ .....
" " No. 2	"	2½c.	@ .....
White, No. 1	"	4 c.	@ .....
" No. 2	"	3 c.	@ .....
Seconds	"	1½c.	@ 1¾c.
Soft Woolens	"	10 c.	@ .....
Mixed Rags	"	2 c.	@ 3 c.
Gunny Bagging	"	2 c.	@ .....
Jute Butts	"	2¾c.	@ .....
Kentucky Bagging	"	4 c.	@ .....
Book Stock	"	3½c.	@ .....
Newspapers	"	2½c.	@ .....
Waste Paper and Scraps	"	½c.	@ ¾c.
Kentucky Bale Rope	"	4 c.	@ .....

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending May 11, 1880:

Hardware.

Baldwin Bros. & Co.
Sew. mach., cs., 1
Baring Bros. & Co.
Telegraph wire, bdls., 203
Billiri H.
Bronze mortars, 2
Blankensteyn & Hennings,
Machinery, cs., 1
Boker H. & Co.
Hdw., cs., 118
Hdw., csks., 5
Hdw., pkgs., 15
Bruckner & Evans
Wire netting, rolls, 100
Burkinshaw W. C.
Hdw., cs., 3
Butler & Huntlig
Nails, kegs, 4
Carey S.
Grinding stones, 17
Charles R. P.
Grindg. stones, 701
Crispin Col.
Cannon with accessories, cs., 3
Sockets and empty projectiles, cs., 55
de Planque E.
Mdse., pkgs., 4
Dolge Alfred
Steel wire, cks., 3
Ely & Wray,
Hdw., cs., 1
Fay J. A. & Co.
Machy., cs., 1
Field Alfred & Co.
Cartridge cases, cs., 12
Hdw., cs., 8
Fisher S. S.
Machinery, cs., 1
Casting, 1
Folsom H. & D. & Co.
Arms, cs., 1
Friedmann & Lauterjung,
Mdse., pkgs., 6
Furness, Bannister & Co.
Hdw., csk., 1
Galway & Casado,
Lead, bars, 433
Ginnel H.
Hdw., csk., 1
Hartley & Graham,
Mdse., pkgs., 2
Hecht Bros.
Hdw., cs., 1
Henry, Henry A.
Ag. imp'ts, pkgs., 5
Hildick A. H.
Chains, csks., 4
Loose chains, pcs., 4
Hdw., csks., 1
Howard Bros. & Read
Hdw., csks., 5
Hdw., cs., 15
Latham & Jeffries
Hdw., cs., 7
Lawrence, Johnson & Co.
Metal, pkgs., 48
Lovemann E.
Machy., pkgs., 16
Ludwig E.
Machy., cs., 8
McClellan G. E.
Telegraph instruments, cs., 1
McCoy & Co.
Levers, cs., 1
Mdse., pkgs., 34
Meier Geo.
Machy., pkgs., 18
Milliken & Smith,
Wire, bdls., 1025
Moss F. W.
Files, csks., 7
Mount James T.
Hdw., pkgs., 3
Newmann Henry
Ironware, cs., 2
Outerbridge A. E. & Co.
Cartridge cases, cs., 2
Prosser Thos. & Sons
Iron rings, bdls., 10
Rogers Henry,
Mdse., pkgs., 4
Seymour Chas. T.
Wire, bdls., 20
Skidmore's J. Sons
Cannel, tons, 101
Stedman & Fuller
Machy., cs., 19
Struller, Lau & Co.
Hdw., cs., 2
Taylor Thos.
Hdw., cs., 1
Thacker H. C. & Co.
Emery stone, tons, 50
Tillotson L. G. & Co.
Wire, lots, 1743
Ward Asline,
Mdse., pkgs., 12
Weber & Schilling,
Machy., pkgs., 32
Wetzlar M.
Ironware, cs., 16
Mdse., pkgs., 3
Wiebusch & Hilger
Hdw. Co.
Cutlery and hdw., pkgs., 49
Witte John G. & Bro.
Hdw., cs., 4
Mdse., pkgs., 4
Wolff S. N. & Co.
Ironware, cs., 51
Zimmerman H.
Chains, cs., 1
Order,
Anvils, 105
Grindstones, 175
Grindstones, cks., 22
Gun caps, cs., 16
Hdw., cs., 15
Hdw., pkgs., 18
Ironware, cs., 4
Lanterns, cs., 15
Washers, cs., 2
Wire, bdls., 3311
Wire, pkgs., 1604

Iron.

Abeel Bros.
Sheet iron, bdls., 434
Bars, 1493
Bank of N. Y. National Banking Assn
Oil barrel hoops, bdls., 20,664
Baring Bros. & Co.
Rod iron, bdls., 105
Bars, 5350
Wire rods, pkgs., 2217
Pig, tons, 263
Galvanized sheets, cs., 3
Blake Bros. & Co.
Plates, 2
Brown Bros. & Co.
Wire rods, coils, 897
Bruce & Cook,
Sheet iron, bdls., 432
Byrne Jos. & Co.
Bars, 2237
Bundles, 245
Sheets, 2742
Crocker Bros.,
Pig, tons, 2173
Crowell & Co.
Bundles, 209
Cutler E. P.
Old iron, tons, 30
de Milt H. R.
Sheet iron, bdls., 404
Drexel, Morgan & Co.
Railway iron, bars, 1672
Elliott, Son & Co.
Ore, tons, 500
Henderson James
Boiler plates, tons, 14
Lee Jas. & Co.
Pig, tons, 400
Mackie C. P. & Co.
Old iron, tons, 8⅝
Marvel Wm. D.
Ore, tons, 443⅝
Mayer Bros. & Co.
Old rails, 479
Nevada Bank,
Gal. sheets, cs., 9
Perkins, Livingstone & Post,
Spiegel iron, tons, 201
Rails, tons, 493
Phelps, Dodge & Co.
Sheet iron, bdls., 160
Pierson & Co.
Hoop iron, bdls., 2407
Sheet iron, bdls., 619
Bars, 380
Sanderson & Son
Scrap, tons, 116
Scrap, cs., 1
Seligman J. & W. & Co.
Pig, tons, 30
Stroud W. L.
Sheet iron, bdls., 759
Wheeler E. S. & Co.
Pig, tons, 200
Wright Peter & Sons
Ore, tons, 400
Yates & Porterfield
Old cast iron, lbs., 36,000
Old wrought iron, lbs., 28,000
Order,
Bar iron, bdls., 453
Bars, 6417
Blooms, 620
Bundles, 21
Cast iron, csks., 728
Fish plates, bdls., 145
Hoop iron, bdls., 241
Hoops, bdls., 402
Lowmoor iron, bdls., 80
Old iron, a lot
Old iron, kilos., 150,350
Old iron railway chairs, tons, 496
Old railroad iron, tons, 100
Old rails, 8617
Old rails and rail ends, 1713
Old rails, pcs., 5821
Old rails, tons, 492
Old tires, 2027
Ore, kilos., 843,400
Pig, a quantity
Pig, kilos., 302,354
Pig, tons, 16,014
Rail ends, tons, 603
Rails, 3148
Rails, tons, 700
Railway iron, bars, 22,088
Scrap, lots, 2
Scrap, tons, 724
Sheet iron, bdls., 1272
Sheets, 1445
Specular iron, kilos., 101,860
Spiegel iron, a quantity
Spiegel iron, tons, 213
Tons, 700
Wire rods, pgs., 1689

Steel.

Baring Bros. & Co.
Coiled steel, bdls., 654
Bars, 1300
Bundles, 724
Blake Bros. & Co.
Bundles, 321
Brown Wm.
Cases, 39
Bundles, 190
Cary & Moen,
Steel rods, bdls., 412
Moss F. W.
Bars, 4
Bundles, 154
Naylor & Co.
Bars, 16
Bundles, 84
Sheet steel, cs., 24
Prosser Thos. & Sons,
Locomotive tires, 10
Steel bands, 298
Schoverling, Daly & Gales,
Bars, 342
Order,
Blooms, 5435
Cases, 1
Casks, 21
Old steel rails, 712
Rails, 4742
Steel flange rails, 807

Metals.

Baring Bros.
Tin, slabs, 6558
Chicago, For
Tin plates, bxs., 342
Cort N. L.
Tin plates, bxs., 98
de Rivera J. & Co.
Old copper, tc., 1
Dickerson, Van Dusen & Co.
Tin plates, bxs., 2052
Menendez Jose
Old copper, tcs., 2
Milliken & Smith
Tin plates, bxs., 1003
Nevada Bank,
Tin plates, bxs., 442
Pfizer Charles & Co.
Metallic bismuth, bbls., 8
Phelps, Dodge & Co.
Tin plates, bxs., 5118
Pratt Chas. & Co.
Tin plates, bxs., 1237
Witte George H. & Co.
Old metal, bbls., 2
Order,
Tin, ingots, 2115
Tin plates, bxs., 4664
Tin slabs, 2419

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending May 11, 1880:

Hamburg.

	Quan.	Val.
S'dpaper, pgs.	11	$262
Cutlery, cs.	3	418
Mach'y, cs.	20	3,833
Nails, kegs.	62	245
Pistols, cs.	5	2,764
Spelter, slabs	2	60
Hdw., cs.	304	6,419
Sew. ma., cs.	882	19,745
Ag. imp., pkgs	353	8,110
Platdware, cs.	2	755
Teleph., cs.	2	750
Belting, cs.	6	1,429
Nails, cs.	2	60
Carbines, cs.	16	2,603
C'ge mtl., pgs.	3	110
Lub. oil, bbls.	5	60

Bremen.

Plm., gals.	397,376	29,803
Ag. imp., pgs.	29	2,050
Machinery, cs.	2	190
Castings, cs.	4	78
Lub. oil, bbls.	46	691
Hdw., cs.	8	193
Pumps, pkgs.	2	100
Belting, cs.	1	250

Danish West Indies.

Hdw., cs.	14	801

Odessa.

Plm., gals.	100,320	15,048

Amsterdam.

Plm., gals.	200,624	17,000

Antwerp.

Plm., gals.	376,200	28,215
Hdw., cs	30	2,497
I. rolls, cs.	6	1,600
Rifles, cs.	3	672
Arms, cs.	3	248
Sew. ma., cs.	22	850
Lghtg rods, cs	2	70
Pltdware, cs	3	210
Mf. iron, pkgs	3	91
Pistols, cs.	1	281
Belting, cs.	2	350
Lub. oil, bbls.	160	1,437

Rotterdam.

Pltdware, cs.	1	85
Ag. imp., pkgs	93	1,205
Hdw., cs.	59	1,380
Burners, cs.	1	146
Machy. cs.	9	650
Lub. oil, bbls.	240	2,880

Belfast.

Ag. imp., pkgs	40	558
Lub. oil, bbls	90	1,300

British North American Colonies.

Coal, tons	344	1,147
Plm., gals.	484	48

British Australia.

Glassware, cs.	10	138
Ag. imp., pgs.	146	6,059
Hdw., cs.	432	7,657
Cutlery, cs.	120	1,775
Ohio nickel, cs	2	90
Plm., gals.	29,800	4,030
Lub. oil, gals.	1310	950
Platdware, cs.	4	1,000
Machy., pkgs.	4	500
Tacks, case	1	60
Pumps, pkgs.	12	715
Nails, kegs	55	250
Tel. mtls., pgs	48	325
Mf. iron, pkgs.	49	1,443
Iron safes	3	750

Barcelona.

Plm., gals.	146,403	11,969

Havre.

Mf. iron, pkgs	1	50
Sew. ma., cs.	86	3,524
Ag. imp., pkgs	17	1,000
Hdw., cs.	2	75
Silverware, cs	3	4,000
Machy., cs.	3	900
Lub. oil, bbls.	50	800

Marseilles.

Machy., cs.	8	184

London.

Hdw., cs.	345	5,865
Crucible, hhds	13	400
Sew. ma., cs.	20	1,095
Machy., pkgs.	133	31,452
Glasswre, bbls	120	2,322
Mf. copper, cs	1	250
Lub. oil, bbls.	195	2,000
Glassware, cs	140	2,652
Brass gds., cs.	11	650
Ag. imp., pkgs	160	8,845
Mf. iron, pkgs	4	116

Glasgow.

Hdw., cs.	9	149
I. rolls, cs.	1	140
Mach'y, cs.	2	310
W. wheel	1	355

Trieste.

Plm., gals.	217,350	17,520

Cuba.

Hdw., cs.	37	1,166
Cop tbes, cakes	3	378
Ag. imp., pkgs	22	936
Windmills, pgs.	50	170
Sew. ma., cs.	13	1,094
Mf. iron, pkgs	255	1,628
Glassware, cs.	14	66
Boiler tubes	44	114
Platdware, cs.	3	90

Porto Rico.

Ag. imp., pgs.	3	75
Plm., gals.	4000	440
Hoops bdls	240	120

Alicante.

Plm., gals.	378,910	38,730
Nails, kegs	4	80

Hayti.

Mach'y, cs.	50	1,142
Hdw., cs.	48	1,022
Nails, kegs	59	323
Cutlery, cs.	10	203
Cartridges, cs	39	985
Guns, cs.	10	400
Sew. ma., cs.	9	425
Glassware, cs.	70	697
Mf. iron, pkgs	10	145
Iron, pkgs.	238	253
Rifles, cs.	5	800

Mexico.

Tin, bxs.	50	300
Firearms, cs.	7	2,289
Cartridges, cs	8	530
Car springs, cs	31	1,279
Nails, kegs	34	198
Wire, spools	147	995
Glassware, cs.	20	208
Cutlery, cs.	103	3,337
Pumps, pkgs.	6	68
Sew. ma., cs.	150	1,827
Gas fixt., cs.	4	265
Mf. iron, pkgs	81	1,138
Hdw., cs.	66	1,271
Guns, cs.	1	47
Plm., gals.	13,910	1,659
Ag. imp., pkgs	2	75
Machy., cs.	32	2,164
Zinc, pkgs	1	40
Mach. oil, cs.	25	36
Cars	2	1,800

United States of Colombia.

Mf. iron, pkgs	9	329
Plm., gals.	4299	515
Shot, sacks	12	87
Zinc, csks.	1	89
Glassware, cs.	7	80
Rifles, cs.	2	83
Muskets, cs.	3	150
Grindstones	100	42
Cutlery, cs.	43	872
Hdw., cs.	38	452
Machy., pkgs.	2	172
Sew. ma., cs.	15	285
Powder, cs.	8	250
Tacks, cs.	1	66
Shot, kegs	5	85
Mf. steel, cs.	1	50
Wire, spools	12	167

Lisbon.

Crucibles, pgs	3	89

Genoa.

Machy., cs.	53	3,640

Brazil.

Pltdware, cs.	9	716
RR matls., pgs	41	1,120
Machy., pkgs.	173	7,440
Glasswre, pgs.	62	1,131
Cutlery, cs.	20	1,716
Irons, cs.	30	165
Nails, bxs.	19	360
Belting, cs.	2	622
Carbines, cs.	25	6,020
Ag. imp., pkgs	66	3,357
Hdw., cs.	313	5,047
R R cars	4	2,220
Silverware, cs.	2	1,026
Locomotives	2	12,000
Sew. ma., cs.	54	1,424
Lub. oil, gals.	971	455
Mf. iron, pkgs.	31	1,085
Tinware, cs.	27	1,153
Plm., gals.	30,000	4,240
Oil stones, cs.	3	52
Cartridges, cs	100	2,500

Ecuador.

Glassw're, cs.	59	1,362
Cutlery, cs.	9	660
Plm., gals.	19,417	2,014
Tacks, cs.	10	240
Mf. iron, pkgs.	213	2,467
I. tank	1	320
Hdw., cs.	125	1,878
Glass, bxs.	250	1,480

Cisplatine Republic.

Plm., gals.	15,000	1,800
Ag. imp., pkgs	40	500

Hull.

Plm., gals.	157,961	12,532
Pumps, pkgs.	15	1,250
Hdw., cs.	121	2,869
Ag. imp., pkgs	178	3,557

French West Indies.

Plm., gals.	11,000	1,216
Hdw., cs.	2	60
Pltdware, pgs	15	1,869

Liverpool.

Machy., pkgs.	65	13,472
Hdw., pkgs.	50	1,806
Ag. imp., pgs.	84	2,100
Arms, cs.	1	247
Met. goods, cs	3	220
Guns, cs.	2	98
Mf. iron, pkgs	5	60
Shade rolls, cs	6	228
Brass gds., cs.	34	2,050
Pltdware, cs.	9	778
Pistols, cs.	1	50

British West Indies.

Hdw., cs.	42	618
Ag. imp., pkgs	15	294
Glassw'e, cs.	16	377
Plm., gals.	14,300	1,767
Sew. ma., cs.	3	40
Nails, kegs	20	113
Glass, bxs.	9	33
Mf. iron, pkgs	10	143

Argentine Republic.

Machy., pkgs.	12	478
Cutlery, cs.	1	247
Plm., gals.	80,000	9,038
Ag. imp., pkgs	101	1,162
Mf. iron, pkgs.	6	90
Sew. ma., cs.	7	125
Glassw'e, pgs.	100	549
Hdw., cs.	102	1,837

COAL.

The market during the past week has been in such a quiet condition and so little Coal was disposed of, that the leading men of the trade and managers of the large companies considered that the proposed stoppage was inevitable. It has, accordingly, been agreed that, for the remainder of the present month, the half-work-and-half-play system should be adopted. It is hoped that by keeping up the system of stoppages, the production can be kept down and prices kept up to such an extent that, by the 1st of July, the market will be in condition to take all that can be produced during the remainder of the year without any falling off of prices. Among the companies there has been, up to the present moment, perfect harmony in regard to the necessary action. Prices are closely adhered to so far as we can learn, and there are no complaints made by one against the other. There are a few outside parties who do dispose of Coal below the circular rates, and thus have more or less influence upon the market.

Customers are holding off and buying from hand to mouth. Most dealers complain of very dull trade, and predict that later in the season there will be higher prices and a greater rush. Even the Philadelphia *Ledger*—the most hopeful of all the newspapers that publish Coal reports—admits, in its last Coal article, that the "trade has been unusually quiet during the past week." In regard to the cutting of prices in that market, it says that while they have been, in the main, maintained, it is sorry to learn that not all the parties concerned have adhered to circular rates. Finally, it says: "There is not much evidence of breaking in prices, and the very few instances that have come to our knowledge are limited in the amounts sold and the decline in prices. This makes the transactions the more indefensible, for it is simply breaking the market, both in the present and for the future, without present or ultimate advantage. In truth it is in every way bad, for it encourages the hope on the part of consumers that if they persist in holding their orders out of the market there will come a break among producers, an excessive production of coal, and, in the anxiety to sell, a damaging cutting of prices."

From such a paper such remarks are very significant. It would seem, therefore, that it has less confidence in the stability of the market than is manifested here in New York.

Prices are nominally the same as last week: Lump, Grate and Egg $4 for Wyoming; Chestnut also $4; Stove is held at $4.25. Lehigh Lump may be quoted at from $5 @ $5.25; Grate, Egg and Stove, $4.25, with Chestnut at about $4. Vessels for Sound ports are still scarce; rates East are still low, and vessels freely offering. To the ice ports the freights are likely to be low for the whole season.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, May 11, 1880.

Pig Iron.—The market still continues its downward course, and prices are again lower. The decline during the week may be placed at from $2 @ $3 per ton, the best brands being held with some degree of firmness, while outside lots are badly demoralized. Buyers limit their purchases to the smallest amount possible, which has the effect of creating unusual urgency among sellers. The immediate condition of the Iron trade is, therefore, one of great perplexity, and, from extreme buoyancy, the market seems to have drifted into hopeless despondency. This eventually may prove to be as temporary and evanescent as the recent "boom" was, and there are not a few who express an opinion that a period of great activity is near at hand. That the recent revival has already spent itself seems very improbable, and there are many good reasons for expecting another active movement. It cannot be affirmed, however, that the country is in as good condition for an advance as it was some months ago, and the most that can now be hoped for is an increasing volume of business, with some margin of profit to the manufacturers. The speculative fever is over, and the visions of wealth to be realized in a few months' trading have been generally dissipated. There is also the disagreeable fact that, beyond certain figures, other countries become formidable competitors. The difficulty to be met at this time is in the vast quantity of material suddenly thrown on the market and the consequent unsettling in values. Some appear to think that this, though unavoidable, has utterly destroyed the summer's business, and that it will take months to recover from its ill effects. The condition of the crops during the coming summer and the prospect of foreign demand, may have an important influence on business. These are matters upon which no definite opinion can be formed at the moment, although they will doubtless have a direct bearing on the Iron trade. The ultimate recovery is considered a matter beyond doubt; but, as previously mentioned, there is a difference of opinion as to the time. Some think that an improvement abroad would react upon this market at once, and that a very slight start would set the entire machinery in motion, while others are of the opinion that production must be curtailed until stocks are in better shape. The question of consumption is probably the most important factor, and if this continues as heavy as during the past 12 months, values will soon become firmly established. At present reports are not quite favorable in this respect, but it would probably be rather premature to assert that the manufacturing interests have relapsed into inactivity. New orders are said to be scarce, and most of the work going on is on old contracts. It is likely, however, that the rapid decline in prices is the reason for orders being kept back. If business is in the healthy condition generally believed, the demand for manufactured articles cannot long remain in abeyance, and with the renewed demand, prices will become settled, and possibly take a fresh upward turn. So far as regards Pig Iron, however, the market at this writing is quite unsettled, and quotations can only be considered as an indication of the market. For small lots of No. 1 Foundry Iron, holders ask $26 @ $28; No. 2 Foundry Iron, $24.50 @ $25.50; Gray Forge, $23 @ $25. English Iron entirely nominal. Scotch offered at $21 @ $21.50 for Eglington; $22 @ $22.50 for Glengarnock; $23.50 @ $25 for Gartsherrie. Bessemer Irons are reported as offered at all sorts of prices from $21 @ $26.

Blooms—Are entirely nominal, and it seems impossible to effect sales at present. Holders ask same as last week, but would no doubt make concessions if sales could be effected. We quote prices nominal, as follows: Charcoal Blooms, $35; Run-out Anthracite, $70; Sunken Scrap Blooms, $60; Northern Ore Blooms, $55.

Muck Bars.—There seems to be no demand whatever, and although there are sellers at $45 @ $47.50, we have not heard of a single transaction.

Structural Iron.—We have to note a decided improvement during the past few days. Inquiries are more numerous, and sales amount to a very respectable aggregate. The decline in prices seems to be bringing in orders, and if all the applications for prices are based on actual business, as they are believed to be, a large amount of work will be given out at an early date. Bridge work is specially active, and several orders have been given out during the past few days, with a considerable amount still under negotiation. Prices are easier, and about 3¢ for Angles and 3.5¢ for Beams, Channels and Tees seem to be the usual asking prices.

Plate and Tank Iron.—The market is reported dull, heavy and weak, and no transactions of note have been reported for some time past. We have reason to believe, however, that some important orders are likely to be placed before long. Inquiries have been made for considerable quantities, and of a character that indicates the certainty of actual business under contract. For the time being, however, everything is as dull as can be, and manufacturers are somewhat despondent at the turn affairs have taken. Prices are irregular, but may be quoted about as follows: Tank and Common Plates, 2.9¢ @ 3.1¢; C. No. 1, 3.4¢; C. H. No. 1 Shell, 3.65¢; Flange, 4¼¢; Best Flange, 6¼¢; Fire-Box, 4¼¢; Solid Bloom, 7¾¢.

Sheet Iron.—There is a little more business doing, but not many large lots are being moved. Buyers appear disposed to wait for further developments, and buy only when compelled to do so by exhaustion of supplies. Manufacturers have reduced prices again, but seem to expect a large demand as the season advances. Merchants and the larger consumers have shown more disposition to place orders within the past two or three days, but we have not heard of any important contracts being actually closed. The stiffening in Tin Plates seems to have quickened buyers somewhat, which shows that values are very sensitive, and, under favorable influences, might soon again show an upward tendency. The following are average quotations for small lots:

Common Sheet, No. 26 to 28	3¼¢
Common Sheet, No. 22 to 25	3 ¢
Common Sheet, No. 16 to 21	4¼¢

Best Refined ¼¢ @ ½¢ advance on the above.

Best Bloom Sheets, No. 26 to 28	7½¢
Best Bloom Sheets, No. 22 to 25	7¼¢
Best Bloom Sheets, No. 16 to 21	7 ¢
Common Red Plates, 3-16 to 16	3.4¢
Blue Annealed, 3-16 to 16	3.5¢
Best Bloom Galvanized, discount	25 %
Second quality, discount	35 %

Bar Iron.—It is difficult to define the condition of the trade to-day. Manufacturers are doing very little work and have still less coming in. Consumption is large, however, but parties appear to have stocks sufficient to keep them going, and, therefore, although consumers are rapidly using up supplies, they are buying comparatively nothing. It is impossible to say how long this will last. Western manufacturers seem to be eager for orders. New York and the East seem to be stocked with foreign Iron. The demand, therefore, is of a local character, and only for small quantities to make up an assortment. The immediate outlook is certainly not encouraging, and prices are weak and irregular. Some ask 2.8¢, but there is no doubt business can be done at 2.6¢ @ 2.7¢, possibly lower. Skelp Iron is inquired for to a moderate extent, and sales of several hundred tons are reported at about 3¢.

Coke.—Prices are nominally unchanged at $2.50, but in consequence of the strike, orders are not being taken at present. Deliveries are being made at $2.50 on sales made last week.

Steel Rails.—As mentioned in our last, there has been a very active movement in Rails, but prices are easier, and may be quoted at a decline of $2.50 @ $5 per ton from last week's figures. Great secrecy is maintained in regard to prices, but there is no doubt that orders were taken last week for considerable quantities at $65, at mill. Higher prices are asked for early deliveries, but $65 @ $70 may be considered about average prices, with a tendency toward lower rates, in sympathy with the decline in raw material.

Iron Rails.—Business during the week, so far as we can learn, aggregates about 6000 tons. A large portion of these were foreign Rails, and one lot of American from stock. Prices were all under $50, and at the moment it would be difficult to find buyers unless at some liberal reduction from that figure. Manufacturers find it impossible to compete with foreign Rails at the moment, and transactions are mostly in these descriptions. The indications of a heavy demand continue favorable, and it is not unlikely that prices of raw material have nearly reached a point at which foreign competition can be met. We quote the market active and feverish at $48 @ $50 for heavy sections.

Old Rails.—The market continues dull, and under a strong pressure to realize, lots have been offered at $26 @ $27, but, so far as we can learn, no one seems to have the courage to make an offer. There seems to be no demand whatever, and until parties find some use for Old Rails, they will continue neglected as at present. The decline seems to be out of proportion to that in other articles, so that when the turning point is once reached, a sharp reaction may be looked for. At the moment they are entirely nominal at $26 @ $27. A sale at $25, Philadelphia delivery, is just reported.

Scrap Iron.—The supply seems to be out of all proportion to the demand, and prices cannot be quoted with any degree of accuracy. Holders ask $25 @ $27 for Wrought, and $20 @ $22 for Cast, but we hear of no transactions.

Nails—Are nominally unchanged, but there are sellers at $4, although $4.25 is quoted as the nominal figure.

PITTSBURGH.

(*By Telegraph*).

PITTSBURGH, PA., May 12, 1880.

The Western Nail Manufacturers' Association, at a meeting held to-day, reduced the card to $3.25 rates and will stop production two weeks in the three, beginning Monday, May 17.

Office of *The Iron Age*, 77 Fourth Avenue,
PITTSBURGH, PA., May 11, 1880.

The event of the past week was the meeting of the Western Iron Association, which was unexpected, and the further reduction in the card, which, although not unlooked for, came sooner than the trade had counted upon. The great object of the Western Iron manufacturers is to get the value of American Iron down low enough to shut out imported Iron, and if this last reduction is not sufficient to accomplish the object sought after, a still further reduction will be made. It is very evident now that the collapse of the boom was brought about by the heavy importations, and, taking advantage of their experience, which to many engaged in the Iron business is anything but pleasant, there is a determination manifested not to make another mistake in the direction indicated. The dullness in nearly all branches of the Iron business is more marked than during any time, possibly, since the panic, and then, with labor troubles and values of all the raw articles unsettled and too high as compared with the product, the situation is not encouraging, but hopes of an early improvement are entertained. The collapse in Iron has affected, directly as well as indirectly, other important interests, including ore, coke, coal, &c., and general business here in Pittsburgh. We feel the effects of the Iron depression more, probably, than any other city in the country.

Pig Iron.—A reliable statement in regard to the furnaces in and out of blast would be very interesting at this particular time. It is known that a number both here and in the valleys have blown out within the past few weeks, and if the market continues in its present condition much longer others will do likewise. Furnacemen in the West, as a rule, are in better shape than they have been for a number of years past; are not obliged, as was the case with some just after the panic, to continue in blast and sell their product as best they could, in order to raise means to meet maturing obligations; on the contrary, the policy now is to blow out whenever the price gets down to or below cost of production, and to stay out while the market continues in that condition. While it is true that the cost of production has been largely reduced, the reduction as yet is not sufficient to cover the depreciation in the cost of the produce, and besides, there is no demand for it at any price. Manufacturers, as a rule, have very few orders. Some of the mills are stopped, and neither mill nor foundrymen are buying unless forced to do so, and then only just enough to meet immediate actual wants. There is now and again an attempt made from the seaboard to effect sales of imported iron, but as already intimated, there is no use in making the effort, as it is not wanted. In regard to the immediate future of the market, there is, as might be expected, a difference of views; some are hopeful of an increased demand within the next few weeks, while others, and these appear to be in the majority, do not look for much, if any, change for the better until the latter part of July, when the fall trade opens up. In the present condition of the market quotations are worthless, as there are no sales, and with no buyers, sellers are refusing to name prices they would be willing to accept in order to effect sales, but it looks as if the market would open at $23 @ $25 for Neutral Forge, and $27 @ $28 for Red Short, and at these rates it is claimed that there would be little if any margin for profit.

Ore.—There appears to be nothing definite as yet in regard to the policy of the Lake Superior companies, but the feeling prevails that they will make a reduction—that they will not attempt to hold furnacemen to the contract price made during the boom. As a matter of right, the Ore companies have the advantage. One company has already notified those furnaces to whom they sold at the advance, that they will allow an abatement of $3 ₱ ton, or $9.50 ₱ ton delivered on the dock at Cleveland, instead of $12.50, and others—possibly all of them—will do likewise. It is very evident that the price of American Pig Iron must be kept down to, if not below, that of foreign Iron, and this could not have been done at the contract price for Ore.

Manufactured Iron.—Mill men nearly all continue to report business very dull, but they are hopeful of an early change for the better. It is natural for buyers to hold off just as long as there is a possibility of prices going lower; but once there is a reasonable assurance that hard pan has been reached, there is good reason to look for an increased business. Reliable advices from the West report that stocks, both in hands of jobbers and consumers, are pretty well run down and will soon have to be replenished, and there is every reason to expect a large consumption, not only in the West, but through out the country. Notwithstanding business is dull, prices are steady, and the belief prevails that the bed-rock has been reached. At current rates the products are low, as compared with the cost of raw Iron. We quote on a basis of 2½¢ for Merchant Bars.

Nails.—The market continues dull and unsatisfactory so far as the manufacturer is concerned, and no real improvement can reasonably be looked for until speculators succeed in unloading and get out of the way. So far as we can learn, manufacturers are adhering to the card—$4, 60 days, 2% off for cash, and the usual abatement of 10¢ per keg on lots of 200 kegs and upward—but there is no difficulty in buying from second hands at $3.40 @ $3.50, net. As the Western factories have all stopped for six weeks, stocks in first hands are light, and the same is true at the leading points of distribution throughout the West. The tremendous supply held by some of the Western jobbers, as reported in the daily papers, turns out, like a good many stories published in the "dailies," to be a myth. The regular monthly meeting of the Western Nail Association will take place here to-morrow.

Railway Supplies.—While business at present is dull, but few fresh orders are coming forward. An active demand is looked for just as soon as values become more settled. That the enhanced cost of Iron killed for the time a good many new railway projects is admitted, but a large number of new roads are under contracts, and then nearly all the old roads will be forced to buy more or less Iron soon. It is expected that there will be considerable inquiry for Rails before long.

Wrought Iron Pipe.—The demand continues light. Discounts quoted at 60 % on Gas and Steam Pipe, and 35 % on Boiler Tubes. Oil-well Casing, 5⅛ inch, 80¢, net Oil-well Tubing, 28¢ @ 30¢, net.

Steel.—While fresh orders are not coming forward very freely, the demand having been offset by the collapse of the Iron boom,

the mills generally are reasonably busy, and the outlook is considered favorable for a good summer and fall trade.

Scrap.—There is nothing doing in Scrap Iron, and while prices are weak and lower, in sympathy with Pig Iron, there is not enough doing to establish values.

Window Glass.—The demand has fallen off somewhat, but manufacturers generally have all they can do. Prices steady. Single Strength, 50 % discount for car-load lots, and 40 and 10 % in a jobbing way. According to agreement, the factories blow out the last of this month and will not start up again until the 1st of September, a month longer than usual.

Coke.—Since our last report there has been a further decline, and $2.50 per ton is now the general price, delivered free on cars at ovens. There is no evidence that the bottom has yet been reached. The building of new ovens has been abandoned, owing to the recent very decided reaction in the market, and the production has been considerably reduced within the past week or two.

Petroleum.—The market has stiffened very materially within the past week, owing, in part, at least, to recent conflagrations in the producing region, by which a large quantity of oil was destroyed, and then the fact that the consumption is likely to be increased soon by the starting up of the refineries, not only here, but elsewhere, is not without effect in the same direction. There are those who regard the article as being good property at current rates, and the belief is general that prices are not likely to rule any lower.

Coal.—Our Coal men, as a rule, are very well satisfied with the situation. They succeeded in getting out about all the Coal they had ready on the last rise two weeks ago, and would not object if there would be no more coal-boat water for a couple of months. The down-river markets are all now pretty well supplied, and with the supply shut off for a few months prices would no doubt improve.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., CHATTANOOGA, May 10, 1880.

The tendency of every saleable thing is to lower markets. Such a state of things induces buyers to hold off, hoping for still better terms. The iron business has become the leading item of steady trade in this district. Every other industry and business more or less depends on the sale and manufacture of Iron for its activity and profitableness. When Iron is dull everything else is dull. The weather for the week has been dry and hot.

Pig Iron.—There is little doing. Prices are weak—if, indeed, there are any prices. A holder anxious to sell any quantity of any kind of Pig would have to concede—take what he could get. Meantime there is no intimation that any furnace in the district will blow out until Iron goes far below the present quotations. We quote: Hot and Cold-blast Foundry, $27 @ $30; Gray Forge, $22 @ $25; White and Mottled, $20; Car Wheel Metal, $47 @ $55.

Muck Bar, &c.—There is no Muck Bar in market, and but little being made by the mills compared with the output a few weeks ago. Wrought Scrap, per gross ton, $17 @ $20; Cast Scrap, per gross ton, $13 @ $17; Old Rails, dull at $28, a reduction of $2; Old Car Wheels, $35. All old material is very dull.

Ores.—The market is abundantly supplied. We have no change to note. Brown Hematite, 50 @ 56 % per ton, $2 @ $2.75 per ton; Red Fossil, $2 @ $2.25, on cars or on wharf from flat boats.

Nails.—There is no market at all. We quote them at $4 rates, nominal. Holders would make sharp concessions on this to do business.

Manufactured Iron.—We quote Bars at $3 rates; Railroad Spikes, $3.25; Track Bolts, $4; Trestle Bolts, $4.50; Fish Plate, $3. A general reduction of about 25¢ round, and a very dull market, especially for Bar. Mill managers would sell for almost anything, just for the sake of trade.

Coal.—Naturally Coal has a weak market, though there has been no reduction yet, but if present tendencies of everything else continue a small reduction must follow. We quote run of mine to manufacturers at $1.62½ @ $1.75 per ton; Lump dull at 10¢ per bushel.

Coke.—The demand for Coke is fully up to the supply, and makers are taxed to their utmost to meet orders. We quote at $3 per ton at Furnaces; Foundry Coke, 10¢ @ 12¢.

Steel and Iron Rails.—Business is entirely nominal. The mills in the district are rolling small orders for replacement. Business is too limited to make quotations of any consequence. Iron Bars are worth $56 @ $58; Steel, $75; small T, $55 @ $60.

BOSTON.

MAY 8.—There has been no improvement in Iron, and prices have continued to settle steadily downwards. In the absence of any demand of importance it is difficult to give reliable prices, but a buyer who went into market would probably have to pay as follows for *American Pig Iron*, f. o. b. at the shipping port: For No. 1 X, $26 @ $28; for No. 2 X, $25 @ $27, and for Gray Forge, $25. Meantime foreign Iron continues to arrive, and the importations at this port the past week have comprised 1502 tons. The foreign metal has been even more demoralized than American, though the latest foreign advices note something of a recovery abroad during the past week. Our own market is unsettled and difficult to quote, but purchases could be made at about $22 for Eglinton; $23 for Gartsherrie, and $24 @ $25 for Coltness. *Manufactured Iron* of all kinds partakes of the prevalent dull and unsettled feeling in the pig metal. *Copper* has sold in a moderate way at 20½¢ @ 21¢, and the inside figure will probably purchase at the present writing. There is a strong bear influence upon this as upon other metals, and the innate strength of the market is indicated by the slight results which have thus far been achieved by it. Manufactures of Copper are unchanged. *Lead* has settled down to about 5¼¢ for pig. Manufactures have been reduced and we now quote: Lead Pipe at 8¢; Sheet Lead at 8½¢; Bar Lead at 7½¢; Tin-lined Pipe at 15¢, and Tin Pipe at 40¢. *Spelter* is quiet and unchanged and we continue to quote 6¼¢ @ 6½¢. *Tin* closes at about 18¢ for Straits, as last week, but is still dull.—*Commercial Bulletin.*

LOUISVILLE.

Messrs. GEO. H HULL & Co., under date of May 8, write us as follows: The market continues dull and depressed. We have revised quotations, which represent the lowest sales reported. There is some little inquiry among some large buyers that must come into the market soon, and the outlook is rather more hopeful than it was two weeks since. Nearly all sales are for cash, and we quote on this basis:

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal	$32.00 @ 33.00
No. 2 " " "	30.00 @ 31.00
No. 1 Southern, Charcoal	30.00 @ 31.00
No. 2 " "	28.00 @ 29.00
No. 1 Hanging Rock, Stonecoal and Coke	30.00 @ 31.00
No. 2 Hanging Rock, Stonecoal and Coke	28.00 @ 29.00
No. 1 Southern, Stonecoal and Coke	29.00 @ 30.00
No. 2 " "	27.00 @ 28.00
"American Scotch"	27.00 @ 28.00
Silver Gray	26.00 @ 28.00
Scotch	28.00 @ 29.00
MILL IRONS.	
No. 1 Charcoal, Cold-short and Neutral	29.00 @ 30.00
No. 1 Stonecoal and Coke, Cold-short and Neutral	27.00 @ 28.00
No. 2 Stonecoal and Coke, Cold-short and Neutral	25.00 @ 26.00
No. 1 Missouri and Indiana Red-short	32.00 @ 33.00
White and Mottled, Cold-short and Neutral	23.00 @ 24.00
CAR WHEEL AND MALLEABLE IRONS.	
Hanging Rock, Cold-blast	50.00 @ 55.00
Alabama and Georgia, Cold-blast	43.00 @ 50.00
Kentucky, Cold-blast	43.00 @ 45.00

W. B. BELKNAP & Co., Iron and Steel merchants, Nos. 113 and 115 West Main street, report to us as follows, under date of May 8: The demoralization mentioned last week has been only increased by the 2.50 Pittsburgh card, and the anxiety now seems to be to escape the clutches of that ever active character who is supposed to take the hindmost. The 2.50 iron card was at once accepted here in wholesale transactions, without the usual freight difference. Nails are sold below the card by all holders, as it is feared they may follow Bar, though there are assurances from some of the manufacturers that such will not be the case. Spikes, Nuts, Chains, &c., have participated to a greater or less degree in the downward movement, about in proportion as they advanced. The extreme drop is exhibited in Scrap, some lots of Wrought being reported as sold at 70¢ @ 80¢ per 100 lb during the last week. Cast from 60¢ @ 80¢, according to quality. These prices will promptly stop its collection and shipment. Meanwhile jobbing trade is fair for the season, and the nature of orders betray broken stocks in the country.

NEW ORLEANS.

Messrs. MINNIGERODE & Co., dealers in Railway Supplies, 61 St. Charles street, write as follows under date of May 8: The market is still in a very unsatisfactory condition. The arrivals from foreign shores have been heavy for the past week of Pig Iron, Old Rails and Merchant Bar. These shipments are as a rule the purchases of two months ago. We hear of no purchases abroad at the present time. Nearly all the Iron arriving has been already placed, although some lots are going into store. The general impression is that the action of the Western Association in reducing the card rate to 2½ rates will steady prices and induce buyers to enter the market more freely. We know of but few transactions of any magnitude. Old Rails have been sold at $30, and this may be regarded as about the price to-day. All old material is in light demand and prices nominal.

CINCINNATI.

Messrs. E. L. HARPER & Co., under date of May 10, write as follows: The volume of business has been gradually increasing, but is still small under a disposition of buyers to hold off as long as possible. Purchases have been mainly for immediate wants, although we hear of a few round lots for future use being picked up at commissions. Prices are unsteady and range about as follows:

	4 mos.
HOT-BLAST FOUNDRY.	
Hanging Rock C. C., No. 1	$30.00 @ 31.00
Southern C. C., No. 1	27.00 @ 29.00
Strong Coke, No. 1	27.00 @ 29.00
Soft Stonecoal, No. 1	25.00 @ 26.00
Open Silver Gray	25.00 @ 26.00
GRAY FORGE.	4 mos.
Hanging Rock Charcoal	$28.00 @ 29.00
Neutral Coke	25.00 @ 27.00
Cold-Short	23.00 @ 25.00
CAR WHEEL—MALLEABLE.	4 mos.
Hanging Rock, Cold-blast	50.00 @ 52.00
Southern, Warm-blast	43.00 @ 45.00
Salisbury	55.50 @ .....

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of May 10: Market still unsettled, but a fair business doing at about the following prices:

Scotch Pig Iron, according to brand	$26.00 @ 29.00
Am. Scotch Pig Iron " "	32.00 @ 34.00
American No. 1 " "	30.00 @ 33.00
" No. 2. " "	28.00 @ 30.00
" No. 3. " "	27.00 @ 29.00
Am. Mot. and White " "	25.00 @ 27.00
Cold-blast Charcoal, " "	42.00 @ 45.00
Warm-blast Charcoal " "	32.00 @ 35.00
Old Rails	25.00 @ 27.00
Wrought Scrap No. 1	23.00 @ 25.00
Cast Machinery, No. 1	20.00 @ 22.00
Richmond Refined Bar Iron, Stand'd.	.03 @ ....
Horse Shoes, Tredegar	.... @ 4.75
Mule " "	.... @ 5.75
Old Dominion Nails, (standard size)	.... @ 4.15

For lots of 200 kegs, 10¢ per keg less.

ST. LOUIS.

Messrs. CARD & HOFFER, Pig Iron and Iron Ore Merchants, 417 Pine street, write as follows, under date of May 8: There is more iron selling, but there is nothing materially encouraging to report.

HOT BLAST CHARCOAL.	
Missouri	$33.00 @ 34.00
Southern	30.00 @ 32.00
Hanging Rock	33.00 @ 34.00
COKE AND COAL.	
Missouri	None offering
Southern	28.00 @ 30.00
Ohio	28.00 @ 30.00
MILL IRONS.	
Cold-short	25.00 @ 27.00
Red-short	30.00 @ 31.00
CAR WHEEL IRONS.	
Missouri	45.00 @ 48.00
Southern	50.00 @ 55.00
Ohio	50.00 @ 55.00
IRON ORE.	
Ore for fix	10.00 @ 12.00
For furnace	6.50 @ 7.50
Brown Hematites	not marketable

BALTIMORE.

R. C. HOFFMAN & Co., Iron and Commission Merchants, report the Pig Iron market as follows under date of May 10: We have little change to report in the Iron market. Sales are light and prices about as follows:

Baltimore Charcoal Wheel Iron	$50.00 @ 55.00
Virginia " "	50.00 @ 53.00
Anthracite No. 1	28.00 @ 29.00
" No. 2	27.00 @ 28.00
" No. 3	26.00 @ 27.00
" Mottled and White	24.00 @ 25.00
Charcoal C. B. Blooms	75.00 @ 80.00
" " Billets	75.00 @ 80.00
Refined Blooms	60.00 @ 65.00

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of May 10: Business for the past week has been dull and depressed, with very little doing in any branches of trade. Prices are somewhat shaded for large orders.

Ref. Bar Iron, 1 to 6 by ⅜ to 1	₩ lb	3 @ 3 2-10¢				
" " 1 to 4½ by 1½ to 2	₩ lb	3@ 3 2-10¢				
" ¾ to 2, Round and Square	₩ lb	3 @ 3 2-10¢				
Hoop Iron, 2½ wide and upward	"	4¼ @ 4½¢				
Band Iron, from 1¼ to 4 in. wide	"	3¾ @ 4 ¢				
Horse-shoe Iron	"	4¼ @ 4½¢				
Norway Nail Rods	"	6¼ @ 6½¢				
Black Diamond Cast Steel	"	13½ @ 14½¢				
Machinery Steel	"	9 @ 9½¢				
Cast Spring Steel	"	8 @ 8¾¢				
Common Horse Nails	"	10 @ 14 ¢				
Perkins' Horse shoes, ₩ keg of 100 lbs		$5.12½				
" Mule shoes		6.12½				
	10	9	8	7	6	
Putnam Horse Nails ₩ lb	21	22	23	24	26¢	
Globe Horse Nails ₩ lb	20	21	22	23	25¢	
Railroad Spikes	3¼ @ 4 ¢					

Less list discount to the trade.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

LONDON, ENG., April 26, 1880.

THE RELAPSE

in our commercial condition has reached lower depths during the past week than could have been thought possible a very short time ago. It is difficult, even to the closest of observers, to account for the full measure of the change, but there is no doubt whatever as to the results actually brought about. Almost everything has become moribund—utterly devoid of life and motion. Even the irrepressible speculators have subsided for the time being, or, at all events, their operations have been conspicuous by their absence. As to legitimate business, it would seem that at present the article is not in existence. From almost every part of the country there comes the same tale, and we have ample evidence of the reality of the depression, in the shape of falling prices and the setting down of works which had latterly been more or less busily engaged. The "rush" is palpably over, albeit one-half of its collateral effects have yet to be made known. Already there are rumors affecting the credit of certain firms in the North, some of whom have burned their fingers by dabbling in crude iron, while one or two houses are reported to be in difficulties owing to this new turn of the market. It is hoped that the latter examples of the "fickleness of all things" may pull through, but there is little hope and no sympathy for the speculators pure and simple. Here and there, production is being limited by the damping down or blowing out of blast furnaces, or the stoppage of puddling furnaces and mills. In two or three instances the same end has been compassed by reason of wages disputes with the workmen. This will afford some little relief, and there can be no doubt that the recurrence of extremely low prices and general weakness will not only tend to weed out many of the present weak-kneed producers, but will also most effectually stop any further increase of the means of iron-making and working. So long as quotations are falling on all sides and buyers are practically master of the situation, there are few owners of works who will have sufficient pluck to spend money in preparing their idle plant, and so throwing themselves into the midst of the *melée*. While prices were fairly well maintained and transactions were reported every day, every man had as good a chance as his fellows, and there was no special inducement for repressive measures. The ironmaster whose works are idle inevitably loses so much money. With a moderate share of orders he loses less and may possibly gain somewhat. With no orders at all, however, the case is worse still; hence I think we may assume that for the present we shall hear very little of new enterprises, and almost as little of the restarting of existing, but idle, plant. As I have stated, the present aspect of the iron trade is dull and flat beyond recent precedent. Its prospects are almost equally vague and vapid. Nobody appears to be able to show with certainty what the course of the trade will be for even a week ahead. Few, indeed, are willing to risk their reputation by the exercise of the dangerous gift of prophecy—unless they know, which they don't. Mr. Samuelson, it is true, tells us that the cry of overproduction has been much overdone, and that we shall almost certainly yet experience a good demand from the United States; but in spite of his views the market falls away almost daily, and there are few persons who are bold enough to foretell an early change for the better. Statistics seem to show that we *ought to be* on the right side of the hedge, but the inexorable logic of facts reveals a widely different result. At such a juncture I think we may not unprofitably institute a brief comparison between the prices, &c., of to-day and those of this date one and two years ago, at both of which former periods we were confessedly at pretty nearly the lowest ebb ever remembered in the history of our leading metallurgical industries. By putting the comparison in tabular form it is, I think, all the more striking, bearing in mind that we are supposed to be much better off now than at either of the previous periods:

	April 26.		
	1878.	1879.	1882.
Scotch fur. blowing,	91	87	114
Glasgow warrants, cash	£00. 51/1	£00. 43/0	£00. 46/10
Gartsherrie No. 1	00. 58/6	00. 48/0	00. 54/00
Coltness No. 1	00. 63/0	00. 52/0	00. 57/6
Glengarnock No 1	00. 57/0	00. 46/0	00. 56/00
Eglinton No. 1	52/0	00. 43/0	00. 50/00
Middlesboro (Cleveland) No. 1 foun'y	00. 43/6	00. 38/6	00. 45/6
Do. No. 3	40/0	00. 35/0	00. 39/00
Hematites	63/9	00 56/3	00. 88/00
Best Steel rails	00. 121/3	00. 90/0	00.165/0
Stafford'ire marked bars	8. 10/0	7. 10/0	9. 00/00
Copper Chili bars, G. O. B.	62. 00/0	56. 10/0	59. 00/00
Do. named brands	62. 10/0	58. 00/0	61. 00/00
Do. Wallaroo,	73. 00/0	63. 00/0	77. 00/00
Do. Burra	71. 00/0	62. 10/0	75. 00/00
Do. English tough	68. 10/0	62. 00/0	66. 00/00
Tin, foreign,	62. 00/0	58. 10/0	80. 10/00
Do. Eng. ingots,	66. 10/0	69. 00/0	86. 00/00
Lead, English pig	17. 00/0	14. 5/0	16. 15/00
Do. soft Spanish	16. 17/0	13. 15/0	16. 10/00
Spelter	18. 00/0	15. 00/0	20. 00/00
Quicksilver	7. 00/0	6. 2/0	6. 15/00
Antimony	50. 00/0	46. 10/0	72. 00/00
Tin plates, I. C. charcoal	00. 22/6	00. 23/9	00. 25/3
Do. I. C. cokes	00. 18/9	00. 19/3	00. 22/6

When one looks over these figures and then compares those of the outside column with the quotations of December, January and February last, the outcome of the investigation is apt to prove startling. For instance, Scotch warrants have been nearly 80/, and makers' iron over 80/; Middlesboro' pig has seen 75/: hematites (what a falling off is there) 150/ @ 160/; copper has been £86 and tin £102; spelter has overtopped £23; quicksilver has been above £8; charcoal tin plates have been 35/ @ 37/6, and cokes 30/ @ 32/6, and all this within the very short space of from three to four months. *O tempora! O mores!*

SCOTCH PIG IRON

has been in a decidedly "panicky" condition during the past week, and scarcely a single day has passed without its accompanying drop in values. Speculators have again suffered severely, and their wild plunges, in the vain hope of getting rid of their liabilities, have probably assisted in effecting the thorough demoralization of the Glasgow market. In a general way, and coolly viewed, the situation would appear to have been rather in favor of higher prices, seeing that at two or three of the ironworks there are disputes with the men, the broad outcome of which has been the damping down of several furnaces, with a concomitant restriction of the output. The iron men of Glasgow have been in no mood to "bear," however; hence the picture presented to-day. The statistical position of the Scotch crude iron trade is thus epitomized by John E. Swan & Bro.: "Furnaces blowing, 114, against 87 a year ago; average production, 23,500 tons weekly; shipments last week, 15,794 tons, against 13,228 tons same week of 1879; increase in Scotch shipments this year to date, 91,417 tons; total shipments of Scotch pig iron to date, 1880, 240,070 tons; monthly average price of warrants, 1880, January, 70/1; February, 67/7½; March, 58/11; pig iron in Connal's stores, 436,653 tons, against 248,436 tons a year ago; increase in stock last week, 458 tons; ballast pig iron, 45/, alongside ship; imports of pig iron into Scotland from Middlesboro' last week, 2575 tons; total ditto to date this year, 69,590 tons." Writing from Glasgow, April 24, James Watson & Co. said: "Since the date of our last we have witnessed almost a panic in our market, owing to a total collapse in the demand and holders losing confidence, a very large speculative business having been transacted. On Monday the market opened at 52/3 and advanced to 52/9, cash, afterward receding to 51/ per ton. On Tuesday the market further relapsed from 50/10 to 50/3 per ton, and on Wednesday the price rapidly fell from 50/2 to 48/6 per ton. Yesterday the market was irregular, with a moderate business done between 48/7½, 49/4½ and 48/, cash, while to day the price has dropped from 48/3 to 46/9 per ton. Makers' prices are all reduced in sympathy with warrants. The shipments last week were 15,794 tons, as compared with 13,228 tons for the corresponding week of 1879." We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow	51/	49/
Gartsherrie, at Glasgow	55/6	52/
Coltness, "	55/6	55/
Summerlee, "	55/6	51/
Langloan, "	56/6	55/
Carnbroe, "	54/6	51/
Calder, at Port Dundas	54/6	51/
Glengarnock, at Ardrossan	55/	51/
Eglinton, "	51/	49/
Dalmellington, "	51/	49/
Shotts, at Leith, deliv. alongside	55/6	55/

HEMATITE PIG IRONS

have felt the full weight of recent occurrences, and have declined in price to an extent scarcely equalled in any other direction. This is exemplified by the fact that last week a certain well-known concern in the vicinity of Sheffield bought a large quantity at a price under £4 per ton. The lot was a large one, and I believe cash was paid, inasmuch as the head of the firm is popularly supposed to be little, if anything, less than a millionaire. I do not give the names of the buyers, but this indication will no doubt enable many of your readers to supply the missing link themselves. Notwithstanding such circumstances, the hematite smelters still maintain their quotations. The following, for instance, could probably be shaded to the extent of 5/, or even 10/ a ton.

	No. 1.	No. 2.	No. 3.
Cleator	121/	120/	119/
Lonsdale	90/	89/	88/
Workington	89/	88/	87/
West Cumberland	....	...	88/
Lowther	89/	88/	87/
Moss Bay	89/	88/	87/
Harrington	88/	87/	86/
Solway	88/	87/	86/
Maryport	87/	86/	85/
Askam	87/	86/	85/

IN CLEVELAND

there has been a heavy fall in prices, probably in sympathy with the altered state of the Glasgow market. The shipments from Middlesboro', &c., continue fairly good, and there is less stock in store by about 13,000 tons than was the case a month ago; but in spite of these favorable tokens there is a general feeling of weakness, and an extensive desire on the part of holders to realize. Some of the speculators are in desperate straits. It is reported, for instance, that one firm which had bought for a rise is in difficulties, with liabilities amounting to about £30,000, and that the positive failure is a matter of days only. Doubtless others are in similar straits. Quotations to-day for Cleveland G. M. B., net cash, f. o. b. Tees, are:

No. 1 Foundry	45/6	No. 4 Forge	39/
2 "	41/6	Mottled	39/
3 "	39/	White	38/
4 "	39/	Kentledge	59/

AT SHEFFIELD

there is very little transpiring in the way of trade news that is worthy of especial mention. At the ironworks in the town and vicinity there is less doing, and some of the more recently restarted departments are again idle. At Staveley and Sheepbridge, nevertheless, smelting is active, and the foundry at the former establishment is well engaged on gas and water mains, special machine castings, &c. At Clay Cross the blast furnaces are kept going and the foundry is running on general castings, colliery tubbing, &c. At Butterley, bridge and other girder work is the mainstay of the place. At Thorncliffe, Newton, Chambers & Co. are fairly busy. With their own coal, ore, &c., this company are in a position to compete on very good terms. The Bessemer works are well engaged so far, with about one exception. The cast steel houses are fairly busy, all the principal firms having respectable American orders on their books. In cutlery there is no particular change. The chief houses are well supplied with orders from your market—some of them having already made their arrangements over most of the year 1880. In files, edge-tools, saws, &c., there is a moderately good business, but prices are not quite so firm.

THE TAY BRIDGE INQUIRY.

has been resumed in London, and is progressing *de die in diem*. Up to the present time the evidence has not revealed a very creditable state of affairs; indeed any one in want of a subject whereon to pour out strong language, might readily utilize the statements of most of the witnesses as useful pegs for that purpose. As the inquiry has not yet been concluded, I do not propose to say much about it in the shape of criticism or comment, but would simply direct attention to the evidence as it stands reported in the newspapers all over the country. It may, of course, be urged that all this testimony is purely *ex parte* and one-sided, but I do not think that such a contention would deserve much respect, the status of many of the witnesses being such as to place their facts and figures beyond cavil. It now appears that the bridge, important although it was in every sense, was constructed in an extraordinarily haphazard sort of way. No efficient supervision appears to have been employed, either during its erection or afterward; consequently, defects of the most glaring character were permitted to stand, and it was evidently nobody's business to have them rectified. You will notice that Noble, the inspector of the bridge, deposed to finding a large number of cotters loose, and that there was a slit in one pier 5 feet in length! Another pier had a slit 6 feet in length, and three or four others were similarly defective. Owing to the bad fitting the ties "clattered" very much. Another witness (Hadland) said some of the bolts and nuts were of inferior iron—that of Jacques'—and he believed that the manager was bribed to accept it! The bolts were neither turned nor fitted! Many of them were split or broken off at the head by being knocked up. There was no inspection of the bolts, &c., by the contractors. The castings were uneven—⅛ of an inch on one side of a column, and 1⅝ inches on the other side of the same column! I need go no further. Such evidence is absolutely nauseous and disgusting to peruse.

IN STAFFORDSHIRE

iron business is on a conspicuously small scale, the consumptive demand being below the production, and the state of the open market anything but brisk. As one consequence of this state of things several furnaces are being damped down or blown out. All mine pigs are very easy at £4 @ £4. 5/, and cinder pigs at £2. 5/ @ £2. 10/. Even less money than these figures would, no doubt, be accepted for decent orders for early delivery. Marked bars are nominally unaltered on the basis of £9, but there are beginning to be evidences of underselling, and if no improvement takes place within the next week or two we should witness an official drop of 10/ or £1 a ton. Unmarked iron is plentiful, and to be had at all sorts of quotations, from £7 upward. Hoops are £8. 15/, and sheets, £9. 10/ @ £10. Galvanized and fencing wire are both easier, owing to the bad tone of recent Australian telegrams. Despite all these untoward circumstances, makers are impressed with the idea that the relapse will prove but temporary.

AT BIRMINGHAM AND WOLVERHAMPTON

the leading branches of the hardware industries are very quiet—so dull, indeed, are some branches that much of the recent increase in values is gradually being lost. Certain cut nails, bolts, &c., for instance, are lower to the extent of 1/ per cwt. In some quarters an improved demand from the ironmongers and other classes of home hardware dealers is reported. Their requirements seem to run on cultivating tools and appliances, with here and there a few orders for season goods, such as traveling trunks, baths and table ware, but in the aggregate the movement thus indicated is not large, and it scarcely seems likely to broaden and deepen until the period of harvest approaches a little nearer. Stocks in the rural districts are undoubtedly very low, as a rule, so that a favorable harvest will certainly administer a great spurt to the home markets. So far we have had most magnificent weather, and a good hay time and corn harvest seems quite on the cards. Export business does not revive rapidly, but with a few markets there are

capital exceptions in several lines of goods. Yates & Co., of Birmingham, a firm who have made special efforts to compete with American edge tools, are said to be in regular receipt of handsome orders from the Cape, West Indies, Australia and certain South American markets. From Brazil they are receiving large indents for "Collins" pattern English axes. Other houses are doing well in hoes, picks, &c., and in matchets for Cuba. On the other hand, large quantities of American hay forks, clocks, axes, &c., are regularly coming into Birmingham, &c., as well as French and Belgian saws, domestic notions, tools, lamps, &c., German wire, lamps, Belgian guns and revolvers, Swiss watches and woodenware, &c., &c. In the Bilston district, where the stamping trades are chiefly located, prices are lower to the extent of 2½ to 10 per cent. on fry pans, rice bowls, dish sheets, &c.

SOUTH WALES AND MONMOUTHSHIRE

are fairly well engaged, much of the current output of the iron and steel works being apparently on American and Canadian account, judging from the following list of the shipments last week, namely: Rails to New York, 670 tons, by the Dowlais Iron Company; 500 tons by the Rhymney Iron Company; 900 tons by Messrs. Crawshay Bros.; 1503 tons to Quebec, by Mr. W. Y. Edwards; 1100 to New Orleans, by the Dowlais Iron Company; 1115 tons to New Orleans, by the Rhymney Iron Company; old rails to New Orleans, 200 tons, by Messrs. Barton & Son; pig iron to Philadelphia, 920 tons, by the Forest Iron and Steel Company; bars to Amsterdam, 75 tons, and sheets, 75 tons, by Messrs. Booker & Co. Cyfarthfa is alleged to be growing quiet again, and there are renewed rumors of intentions on the part of the proprietors (Crawshay Bros.) to convert part of the establishment into steel works. At Dowlais a new mill (for sheet rolling, I believe) is being erected. Sir Ivor Guest, the proprietor of Dowlais, is likely to be created a peer. In the neighborhood of Swansea the tin-plate works are irregularly engaged, and there is much trepidation among the manufacturers by reason of the astonishing fall in prices. Should the depression continue, a restriction of production will no doubt be again had recourse to.

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, April 25, 1880.—*Metals.*—A steady improvement in general business has been noticeable here, but has not extended to metals. *Copper* is again considerably lower. We now quote Chili Bars, 155 @ 157.50; Ingots and Slabs, 168.25; Best Selected, 170; and pure Corocoro Ore, 162.50 francs the 100 kilos. *Tin* has remained weak and drooping all along, the total decline for the week being 10 francs. We quote Banca, 215; Billiton, 212.50; Straits and Australian, 211.25; and English Refined, 212.50. *Lead* has been dull, giving way 1 franc. We quote it deliverable at Havre, 42.50; and here, 43.50. *Spelter* has been the only metal uninfluenced by the demoralization now reigning in the markets. We quote Silesian at Havre 54, and other good brands here and at Havre 53.50. *Iron.*—Some speculative holders, getting alarmed at the doubtful aspect of the Iron trade abroad just at present, their stocks have been pressed upon the market, leading to a general decline. Merchant Iron still sells in moderate quantities at 25 francs; Flooring Iron at 26, and Common Sheet Iron at 30 francs. At the works in the Iron regions prices have been tolerably well upheld; makers seem to incline to the belief that in view of the many constructions planned all over France for the ensuing summer, the present decline at the distributing centers will only prove temporary. It is hoped, moreover, that the speculators will soon have realized what they hold, and that consumers will, after a while, return to the legitimate channels of supply. One of the leading Iron houses here has just contracted with forges at the North for Flooring Iron it stands in need of at 24 francs at the works. The quantity thus secured is a large one, and is a proof of the confidence which some of our largest Paris concerns possess in the future of Iron prices. At the Haute Marne the current quotations are still 25 francs for first-class Merchant Iron; 27 for Mixed, 28 @ 29 for Charcoal and 30 for ditto first quality. Special first-class, 25 @ 26; Machine, No. 20, Coke, 26; Sheet, Coke, first-class, 26 @ 27; Axles, 26 @ 27; ditto Finished, 36 @ 37; English Sheet, 28; Iron Wire, No. 20, 28 @ 28.50; Nails, No. 18, 35 @ 36; Castings, 14.50 @ 29; Moulage Pig, 14 @ 16. At Valenciennes the meeting of iron masters has confirmed the previous price list, which leaves Merchant Iron 24 francs. Most of the Northern forges have work enough in hand to last them for the campaign. The second meeting has come off at Maubeuge on the 22d inst. A great Steel works will be created at Montmedy, between Ecouviez and Grand-Verneuil. Goods for the Melbourne Exhibition are loading at Toulon on board the Finnisterre, leaving early in May. *Coal.*—This fuel is about 50 per cent. lower than it was three months since. Sales have been effected here at 44 francs. At the North and in the Pas-de-Calais prices are weak. At St. Etienne the shipments are on the decrease.

BELGIUM.

(Revue Universelle.)

BRUSSELS, April 25, 1880.—*Iron.*—A decline of 2 francs has taken place in response to the accounts from abroad. Merchant Iron sells at 13 francs, Pig at 8.90 @ 10; Beams, 22.50; Rails, 24.50. Makers are, nevertheless, not discouraged; they are evidently under the impression that the present reaction will not last long, and they show a tolerable amount of firmness, the more so as most of them have still got a good many old orders on hand keeping them busy. For aught we know, they may be right in not getting frightened at the first serious recoil. At all events, everybody has now received a fair warning. The spring trade has proved a great disappointment and the reaction has followed closely upon its heels, proving the sensitiveness of prices driven up by speculation, but no more supported by it. We are now getting upon a sounder and safer basis, which can only be welcome to the general Iron trade, though thwarting the plans of the adventurous element. *Coal.*—There has been no essential change since our last report. Mixed Coal still sells at 12 francs and Washed Coke at 24. There is a plan on foot to suppress, for the time being, Monday as a working day, and thus curtail the output.

GERMANY.

(Borsenhalle.)

HAMBURG, April 22, 1880.—*Iron.*—We hear from the Sarre, Luxembourg and Lorraine districts that, although slower here than anywhere else, the generally drooping tendency in the Iron markets is making some progress. Pig Iron having declined at Luxembourg 10 francs in three weeks. In Upper Silesia there is still great animation in Iron, at lower rates for Merchant Iron. Although there is nothing very encouraging in the present state of business there, it is believed that during the coming summer and fall matters will mend. On the Lower Rhine and Westphalia but a moderate Iron trade is transacting. Our weekly report from Dortmund reads as follows: "Iron has remained pretty much unaltered here. A good many Iron and steel works have got work on hand for the present, but they begin to get uneasy about the future, for in two or three months from now present orders will most of them be filled. Other makers have work enough to last them into the fall. It cannot be denied, however, that the general tendency is a decidedly downward one, if therefore the orders for railroad material for German railroads, so long and so frequently held in prospect, do not soon make their appearance, quite a break in prices seems to us unavoidable. Nor do the accounts from England and America at all look as though the Iron trade would experience another revival. Despite this by no means reassuring outlook, the workmen of five file manufactories have struck for higher wages at Remsheid. Iron production in the Dortmund district during the first quarter of 1880 has been 3,802,067 cwts. of Pig, against 3,294,110 cwts. the previous quarter, and 3,185,683 during the first quarter of 1879. Merchant Iron, 2,670,422, against 2,513,572 and 2,256,952; Iron for castings, 3,018,952, against 2,528,884 and 2,285,502." *Metals.*—The general market has been flat and inactive. *Lead* unchanged. We quote English Pig, 17.50 @ 18; ditto Sheet, 18.20 @ 18.50; German Pig, 17.50 @ 18, and Spanish, 18.50. *Copper* is lower. We quote Swedish Atvidaberg, 74; Drontheim, 77; English, 68 @ 69; ditto Sheathing, 80 @ 82. *Tin* is rapidly declining. We quote Banca and Australian, 89 @ 90, and English, 90 @ 94. *Spelter* is quiet at 22 marks; Sheet Zinc, 27 @ 27.25 the 50 kilos.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, April 25, 1880.—*Iron.*—Stagnation in the Iron trade is the rule just at present throughout Austria and Hungary. A good trade had been looked forward to in articles suitable for the spring trade, but in vain. The greatest mischief has been done by the combination among makers to uphold the prices ruling early in the year. By adopting this disastrous policy while Iron had begun to decline everywhere outside of this country, they discouraged all business, and now, when they would be but too willing to effect some sales, there is no demand. They will either have to decline sufficiently to stimulate a demand, or they will have to wait till the Iron markets of the world improve once more and get them out of the scrape. For this they may have to wait a long time. The worst is that there is no export demand whatever; all the works are doing is to execute the few old orders left them. Not having anything better to do, they are complaining of the low price at which these orders they are still now filling were contracted for, and that the entire revival of last fall and winter has not benefited them in the least. But for this they have only themselves to blame and their bad management. Another complaint they are indulging in is the one of too low duties on Iron coming from Germany, but of these only the Northern works complain, for the works in the mountain districts do not fear German competition, nor is it likely that the duties will be raised, now that we are trying to form a customs' league with Germany. We quote Charcoal Pig £ @ 6 30 florins the 100 kilos.; Gray do., 6.50 @ 6.70; Bessemer, 6.80 @ 7; Spiegeleisen, 9; Coke Pig, 6 @ 7—all at the works. Corinthian Merchant here, 14.50; Sheet, 17.50 @ 18.50; Bohemian sheets, 13.50; Boiler do., 17; Pillars, 12.50.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, April 27, 1880.—*Tin.*—This metal is again duller, and very little transpires in it. A few sales of Banca have been effected at 47.87½ @ 48 guilders the 50 kilos., and of Billiton at 47.50, at which some more may be had, but not in large quantities.

CHILI.

(Ferrocarril.)

VALPARAISO, March 21, 1880.—*Copper.*—The week has been a tolerably lively one, the price on shore being $19 per quintal, and on board, $19.5 @ $19.75. In spite of the unfavorable advices per cable from London, prices have been well sustained by apprehensions of a decline in Exchange. P. S.—March 27.—Some few more sales have been effected at $19.25, on shore, and $19.92½ on board, on the coast. Last night, however, Chili Bars were cabled as low as £65 from England, a fresh decline of 30/. in accordance with which we shall probably give way here 20¢ @ 30¢ per quintal.

The Prevention of Smoke.

A committee was appointed some time since by the Citizens' Association of Chicago, to which was referred the question of recommending some means by which the nuisance of smoke can be abated. This committee, consisting of R. T. Crane, G. W. Blatchford and D. H. Hale, report as follows:

It was well known at the outset that much time and research had heretofore been given to this important matter by the best scientific talent in the world, for many years, without much benefit from practical results, but we were unprepared for the eagerness with which we were met on all sides by those who were anxious to forward our views, and were gratified to find public interest so much aroused and desirous of our success in ascertaining some measures for relief from the smoke nuisance. The same agitation appears to be going on in Great Britain, where corresponding societies have been formed in the larger cities for the sole purpose of dealing with this question, and we can say right here that we cannot ascertain from our correspondence that any greater progress has been made there, nor any better or essentially different devices discovered, than here, for the prevention or combustion of smoke.

It is not out of place to refer briefly in this report to the scientific principle which underlies all proper and systematic efforts to prevent smoke, for it is its prevention and not its destruction or consumption that should be aimed at. This principle is the complete combustion of the gases which arise from the consumption of fuel. Let there be complete combustion and there will be no smoke, properly speaking, although almost invisible vapor or gases will arise from the chimney tops. To promote this complete combustion atmospheric air, in the proper quantity, must be admitted to the furnace and be allowed to mingle with the gases, while at the same time they should be brought together by some mechanical process, and not allowed to escape through the flues until their use has been of thorough avail by their complete combustion: the residuary vapor alone should pass out above. In ordinary furnaces, when in charge of careless or incompetent men, this cannot be done, and the dense volumes of smoke that are seen rolling from the chimneys of some manufactories are a sure indication of carelessness or incompetency in the boiler room. But, however well the fireman may do his duty, there will be at all times a good deal of smoke, unless some simple contrivance is used to assimilate the gases and supply the proper modicum of atmospheric air or superheated steam, so as to produce perfect combustion, and the various devices and inventions brought to our notice have been recommended as combining, in a greater or less degree, the scientific and mechanical principles herein alluded to. It is not our object to recommend any particular invention, nor even to point out the excellencies of any mode or system for preventing smoke. The inventions and devices are almost innumerable, the patents issued are several hundred and the number rejected much greater, and many of them possess merits of their own. They include: A water drum (with leg) in front of the bridge walls and inclined bars; deflecting arches in front and rear of a hollow iron bridge wall, perforated for the supply of air; such an arch over the bridge wall, with an arrangement of the furnace doors so as to supply the proper quantity of air; surface-draft inventions, combining the application of hot steam and atmospheric air; a perforated fire-box for the incandescence of the fuel in front of the flues, with a gas chamber and arrangement for the supply of air or steam; automatic feeders of various patterns, including one which pulverizes the fuel and spreads it evenly upon the burning mass under the boilers; various applications of superheated steam, gas and hot-air chambers, for the admission of air into the furnace. All these have, as stated, merits peculiar to themselves. We incline to the belief that no plan can be perfectly worked without intelligence in the boiler room—no device will display its own complete capacity.

We are indebted to some of the great railway companies of England and France for drawings of the simple apparatus used by them in locomotives and for the history of previous experiments. They agree that smoke can be prevented to a great degree by the use of these appliances, but lay great stress on the stoking or, as we call it, firing. Some companies commend the use of coke when within cities, others that the stoking or firing shall be completed before entering the city, so that new fuel need not be added therein. We are of opinion that these suggestions should receive great consideration, as, if the switch-engines could be confined to the use of anthracite, and other locomotives be provided with simple apparatus and fired with care while approaching and within the city limits, much of the annoyance from that source would be stopped.

The subject is of such great importance that it has engaged the attention of our municipal authorities, and a proposition is now pending to enforce the prevention of smoke by a city ordinance. We take pleasure in stating that we are in accord with the city administration in our endeavors to bring about an abatement of this growing nuisance. The time and circumstances are very opportune, and public sentiment is strongly with us.

From all the evidence examined by us in the shape of correspondence, and from our personal observations of smoke-preventing apparatus in this city, we are of the opinion that the smoke nuisance, as far as it proceeds from stationary boilers and tugs, can be abated so as to be inoffensive, and we recommend that a city ordinance be passed for that purpose, to take effect within such time as will give all persons interested an opportunity to fit their works with such apparatus as they may deem best for the purpose. The same opinion applies, measurably, to locomotives, and they should be included in the ordinance. Such a law, in its details, should contain provision for an adequate penalty for its violation from any cause except unavoidable accident, and for one or more inspectors constantly engaged in its execution.

Denis Papin.

The Mayor of Blois, France, asks the cooperation of the American public in erecting in that city a statue of Dénis Papin. He says:

Local tradition long maintained that Dénis Papin was born at Blois, but this was only a vague legend, perpetrated from generation to generation. In 1834 the registry of his birth was discovered in the archives of our town, where he was born on August 22, 1647.

When he was 24 years old and was studying medicine at Angers, he contracted a strong friendship with the celebrated Dutch savant Huygens, who was attending lectures at the academy of that town, and who recognized in Dénis Papin a mind of a strong scientific bent.

Having taken his degree as doctor of medicine, the latter went to Paris and then suddenly crossed over to England. At this period, it must be allowed, his coreligionists (for he was a Calvinist) were being persecuted by the Ministers of Louis XIV, and not wishing, for that reason, to return to his own country, where he saw no promise of a comfortable life, he made his way to Venice and thence returned to England. But the edict of Nantes was revoked in 1685, and Dénis Papin, finding it impossible to return to France, determined to settle in the town of Marburg, in Germany, where a portion of his exiled family was already domiciled.

I will not write his biography. I need to say, however, that at the age of sixty he embarked with his family on a steamboat constructed by himself; that it was his intention to exhibit his machine and transport it to England; that he arrived at Loch, near Munden, on the Weser, and that on September 26, 1707, his invention was destroyed by the Mariners' Guild of the Weser, who had the monopoly of navigating that river.

He survived this catastrophe ten years. His hopes as a man of science were destroyed. The few resources he possessed were gone. He had always had little; he now had nothing.

When one sees France so rich in monuments and statues, it is melancholy to think that Dénis Papin has not even a tomb to recall his memory.

His native town has understood that it had a duty to perform. It long entertained the idea of erecting a colossal statue which should be worthy of the inventor of the motive power which has changed the face of the whole world. In this scheme it feared that it might fail. It has, therefore, decided to raise a statue of more moderate proportions, which shall put future generations in mind of this man of genius.

But the mite of the United States, however small it should be, would be a memory which the town of Blois would cherish. It would be a proof of the sentiments of sympathy which unite the two great republics.

The action of the Paris World's Fair Commissioners of 1878, in ordering the striking of many thousand medals for distribution among the foreign commissioners, juries and non-competing exhibitors, simply as pleasant memorials of the fair, is very noticeable. An outlay of $60,000 for this simple act of courtesy, two years after the event, is something that many countries would not have thought of, or would not have accomplished if they had thought of it.

LABOR AND WAGES.

The managers of the Susquehanna Rolling Mill, Lancaster, Pa., surprised the local union, a branch of the Amalgamated Association of Iron, Steel and Tin Workers, by running their mill full turn a few days after the union men had withdrawn from it on account of a petty difference of opinion in regard to the employment of one or two men.

The following are the average wages paid the different classes of workmen at the Bethlehem Steel Works, as given to the Pennsylvania Bureau of Statistics:

	Per day.
Foreman, various departments	$1.58 to $6.00
Engineers, stationary	1.26 to 2.00
Firemen, (Boilers)	1.11 to 1.38
Hands in steel mill	1.08 to 6.00
Roll hands, Rail mill, Merch nt mill	.48 to 4.00
Puddlers	3.00 to 4.00
Puddlers' helpers	1.40 to 1.98
Teamsters	1.00 to 1.53
Boys	.30 to .75
Foundrymen	1.25 to 2.25
Machinists	1.15 to 3.00
Carpenters	1.25 to 3.00
Blacksmiths	1.35 to 3.20
Blacksmiths' helpers	1.04 to 1.14
Brick and stone masons	1.58 to 2.07
Train hands and brakemen	1.69 to 2.10
Laborers	.85 to 1.24

Nearly if not quite all of the coke works in the Connellsville region are idle from a strike against a reduction of wages for mining coal and drawing ovens. The rates offered are coke drawing, per oven, 70 cents; mining, per wagon, 30 cents. The wages of the other laborers are also to be reduced, but how much the notice posted does not say.

The boiler makers of the Huber Manufacturing Company, Marion, Ohio, have issued their "bull against the comet," and struck against the introduction of machinery—the machine in the case being a new appliance for riveting. The strike will probably be of short duration.

The strike of the muck rollers at Wheeling, W. Va., is over, and has ended in the manufacturers accepting the scale offered by the men. The scale is based on the price of nails, and ranges from 62½ to 99⅝ cents.

Some of the members of the Amalgamated Association of Iron and Steel Workers are not satisfied with the tariff demonstration that is to be held at Beaver, Pa., June 5, and propose to hold one of their own at Pittsburgh about the same time.

Referring to the strike of the muck rollers in the mills of the Wheeling (W. Va.) district, a local paper says: The Bellaire (Ohio) Nails Works is one of the most fortunate manufacturing establishments of our acquaintance in regard to strikes. To a large extent the mill is operated on the co-operative plan, nearly all the higher classes of workmen being also stockholders. None of the employees hold membership in the Amalgamated Association, and, consequently, they ran on this week without hindrance or embarrassment.

The coal miners of Western Pennsylvania held a meeting last week, at which it was decided not to accept any reduction. The following resolution was passed: *Resolved*, That this convention accept no reduction, and that it approves the actions of the Inter-State Convention *in toto*.

The Amalgamated Iron Association have sent a check of $1000 to the Richmond strikers. This is rather a small amount to distribute among several hundred men who have been idle for over two months.

There has been a strike or lockout at the Catasauqua Mill, Catasauqua, Pa., owing to the discharge of a number of union men.

The Schuylkill Coal Exchange, at Pottsville, isued the following circular on May 4: The following collieries, having been drawn to return prices of coal sold in April, 1880, to fix the rate of wages to be paid in that month, make the following returns:

Merriam Colliery, P. & R. C. & I. Co.		$2.47
Mahanoy City Colliery,	"	2.51
Preston No. 2 Colliery,	"	2.50
Potts Colliery,	"	2.45
North Ashland Colliery	"	2.40

The average of these rates being $2.46 3-5, the rate of wages to be paid in April, 1880, is one per cent. below the $2.50 basis. As previously announced, the rate of wages for April will be the full $2.50 basis.

The puddlers and helpers of the Allentown Rolling Mill held a meeting at Allentown on May 5, and resolved to demand their wages earned in April and refused to them May 3d. "And we also demand the company to make up or pay for the time lost since you stopped down, it not being our fault, but yours. We are all agreed, as workmen, to start at any moment at a medium scale. We, as puddlers, boilers and helpers, agree to go by the following scale, viz., giving you (the company) the privilege of choosing any paper that quotes on the iron market. On common iron, 8 per cent. on the dollar, the scale to run from $45 up to $75 per ton. Above $75 per ton, the company has the privilege to change the scale. The puddlers claim the privilege of changing the scale when rails are sold below $45 per ton. (You will please recollect that the scale formerly in use was 8⅓ per cent. on the dollar.) For boiling iron: When bar iron sells at $40 per ton we demand $3.75 for boiling, and for every $5 raise per ton 25 cents raise for boiling, giving you the privilege of changing the scale when bar iron sells above $75 per ton in the market, the employees claiming the privilege of changing the scale when bar iron sells below $40 per ton."

Notices have been posted up in all the mills in South Harrisburg to the effect that a reduction of 50 cents per ton will be made on the work of the puddlers in the mills on and after June 1.

The Boston *Transcript* says: A new machine for measuring leather accurately was exhibited Saturday afternoon at the factory of Palmer & Smith, No. 67 Hamilton street. It consists of an upper and lower table, the leather to be measured being placed on the lower table. The weight of the upper table is counterpoised by an iron bar equal in weight to the table. Pendant from this table are 3240 weights, giving a surface measurement of 45 feet. There are 72 weights to each square foot. The lower table is perforated, allowing the weights on the upper table, when nothing is on the under table, to drop down. If a piece of leather is on the under table, the weights rest on it and move a pointer on a dial, the pointer being capable of indicating 45 feet, and each foot of the leather on which the weights rest is indicated on the dial at once, the pointer moving once for each 144 square inches. There is a water-stop by which the pointer can be instantly stopped. The inventor is D. T. Winter, of Peabody, Mass., who has been working at it five years. The first machine cost $1000, but it is now retailed for $200. This is the one hundredth machine, and there is one other in the city in the factory of Young & Co.

Compound Armor.—An important gunnery experiment took place lately on board the Nettle target ship, in Portsmouth Harbor, with a composite plate specially manufactured by Messrs. Cammell, of Sheffield. The plate was an experimental one, and was fired at to ascertain whether an improved process which had been invented for fusing the iron and the steel together does not increase the powers of resistance of armor plating. The plate measured 6 feet by 5 feet 8. As it was so small comparatively, it was resolved to fire only two shots at it instead of three as is the custom, but the plate came out of this test so satisfactorily that the arrangement was not adhered to. The thickness of the plate was 9 inches, an outer surface of 3½ inches being fused on to 5 inches of iron, the process of fusing being, it is understood, carried out while the iron is placed in a vertical instead of a horizontal position. The plate was securely wedged in an iron frame fixed to a tranverse wood bulkhead, and the weapon used was, as heretofore, a 12-ton 9-inch muzzle-loading rifled gun, standing behind a thwartship bulkhead 30 feet from the plate, and charged with 50 pounds of battering pebble powder and chilled Palliser shots 25 pounds in weight, giving a muzzle velocity of 1420 feet per second, and an energy at the muzzle of 3486 feet. Both projectiles broke upon the plate, only their points entering, and these not to any serious extent, while the few cracks which were occasioned were superficial in character. These shots were fired in the morning, but in the afternoon the Director of Naval Construction visited the Nettle, accompanied by the Italian Attachés, and it was then decided to discharge a third projectile at it. The plate stood this test better than had been expected, the penetration being comparatively inconsiderable, and the depth to which the cracks extended not going beyond the steel. Indeed the results of the trial exceeded those which had been obtained with most, if not all, the sections of armor-plating manufactured for the turret-ship Inflexible.

The Petroleum Fields of Russia.—The owners of American petroleum deposits will before long have to encounter a considerable amount of opposition in view of the discoveries of this valuable oil on the Continent, and especially in Hanover and Russia. The beds in the latter country are comparatively boundless, extending for a distance of 1500 miles along the Caucasus range, from the Caspian to the Black Sea. At the present time, however, there are but two districts in this large area where any systematic efforts are being made to obtain the petroleum. One is in the valley of the Kuban river, which flows into the Black Sea, where two wells have been sunk by a French company under the superintendence of an American manager. This company has a refinery at Taman. The other and most productive district is near Baku, on the Caspian Sea. Many wells have been sunk here to the depth of 300 feet, having a daily yield of 28,000 barrels of crude petroleum. An extraordinary amount of sand flows out with the oil, and is heaped up near the orifice of the wells in banks at least 30 feet high. Large refineries exist at Baku, though the refined oil at present produced there is not as good as the American oil.

A railroad with some novel features has been recently opened between the stations of Ribeauville (on the Strasburg Basle line, Germany), and the town of that name about 4 kilos. distant. The line is on the road (with which the rails are level), and has a narrow gauge of one meter. There are inclines of 40 mm., and curves of 50 meters radius. The train requires only one engineer and one guard. The locomotives weigh 9 tons, and among the rolling stock are ten platform wagons, which are arranged for conveying wagons from the main line without the goods being transferred. These platforms carry two rails, corresponding to the normal larger gauge, and they rest on two bogie trucks having four wheels each. Thus the larger wagons can be conveyed over the sharpest curves of the narrow line. These platform wagons weigh 3 tons, and the large wagons, with full charge, weigh 15 tons, giving a total weight of 18 tons, which, divided among the four axles, gives a maximum load of only 4½ tons per axle. Passengers, as well as goods, are conveyed upon the line. The total cost of the line has not exceeded 250,000 francs.

A peculiar case in relation to weighing scales has recently been decided in an English court, which may be of great interest to scale makers and users in this country. It seems that there is a scale known as Salter's Family Scale, which consists of a bowl-shaped scale on an upright pillar, and a finger and dial register underneath. It is said that 40,000 of these scales are made every year, and thousands of them are in use in the government departments. It was alleged by the prosecutor in this case that, by placing the goods to be weighed on one side of the scale, and not exactly in the center, the weight was erroneously registered, sometimes to the extent of several ounces. The defendants, being a Manchester firm who had sold one of these scales, were found guilty of the charge of having sold a false or unjust balance, and were sentenced to pay a find of 20 shillings and costs. As might be expected, the case is to be taken to a higher court.

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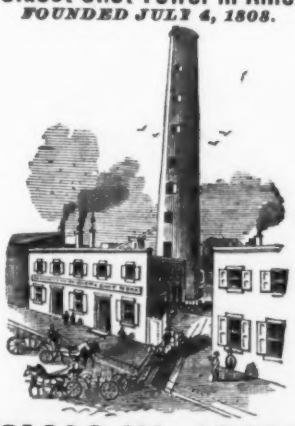

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LIGHT DRAFT AND EASILY ADJUSTED.

Every Machine Warranted to Work as Represented.

Points Claimed as being Meritorious:

Lightness combined with Strength in construction
It runs more easily.
It will cut longer grass.
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The attractive appearance of the machine.
It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with any other machine in the town in which they may reside.

PRICE LIST.

Width of Cutter.	Style. Driving Wheels.	Power required.	Weight.	Price.
10 inch.	8 inch.	A Child.	30½ lbs.	$14.00
12 "	8 "	A Lad.	33½ "	18.00
14 "	8 "	A Lady.	36 "	20.00
16 "	8 " One Man Size.		38 "	22.00
18 "	8 " "	"	41 "	24.0

NEW MACHINES,

For Cutting Long Grass

15 inch, 10½ inch Driving Wheels, 6½ inch Cylinder, Man Size, 48 lbs. $23 00
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THE NEW "CHARTER OAK" LAWN MOWER.

The most beautiful and perfect Lawn Mower in the world. It stands to-day at the head of the list of Lawn Mowers in the United States and Europe. It is mounted on two large driving wheels or pulleys, and instead of being on the outside of the frames, to run in the uncut grass, they are placed *inside the frames*, back of the cutting-blades, running on a shaft, each independent of the other, allowing the machine to be turned either to the right or the left without injury to the sod, and to be turned around in a circle no greater than its own length, and cutting at the same time. Those desiring a perfect Lawn Mower will find the "CHARTER OAK" far superior to any other. It is more durable, easier to adjust, operate and keep in order, and the driving wheels being inside the frames, enables the operator to cut the grass clean around walks, drives flower-beds, trees and shrubbery.

Manufactured in Five Sizes.

8-inch, 10-inch, 13-inch, 15-inch (standard) 18-inch.

H. S. MANNING & CO.,

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Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers, also of Solid Bolt and Pipe Dies. Furnished in V, U. S. Standard and Whitworth shape of threads.

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The Cheapest line of goods in the market.

Sample orders solicited.

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NEW sizes Patent Malleable Iron Oilers, Nos. 2 and 3.
NEW pattern Heavy Screw Clamps; strongest in the market.

Send for Price List.

Malleable Iron Castings

Of superior quality, and Hardware Specialties in Malleable Iron made to order.

HAMMER & CO., Branford, Conn.

No. 2.

The Consumption of Coal in the Iron Trade.

The gradual displacement of iron for many structural and other purposes by steel, is likely to reduce very materially the amount of coal consumed in the iron trade.

It is admitted by the greatest authorities on blast-furnace management that there is room for economy, but that economy will be effected in a different way from the old methods of saving fuel. Hitherto the primary object of improvements in that direction has been to directly reduce the quantity of coal consumed in the blast furnace; the problem of the future will rather seek to utilize to a greater extent than formerly the heating power that has either not been utilized or has been allowed to go to waste. For the last 10 years it has been considered an unusually good result to smelt a ton of iron with a ton of coal, the average rate of consumption exceeding that quantity. Knowing well by experience that it was an achievement to produce a ton of pig iron from a ton of coal, Mr. Menelaus, of Dowlais, stated in 1869 that, in his opinion, it would not be unreasonable to expect a saving of 15 cwt. of coal on each ton of pig iron produced in the blast furnace. That saving has not yet been realized. Nothing has occurred in the experience of the trade to demonstrate its impossibility; on the contrary, the greater success that has been attained in another direction should rather be regarded as an evidence of how theoretic possibility can be reduced to practical utility. Mr. Menelaus, however, did not make his estimate on purely theoretical grounds. The great scientific authority of Dr. Siemens had previously been pledged to accomplish a saving of 50 to 60 per cent. by the application of the gas regenerator, which was being extensively employed even then in the United States and Yorkshire, but which has since then not been so generally adopted in the iron trade of this country as might have been expected, owing probably to two facts—first, although the saving in fuel was represented as great, the cost of the apparatus was also great compared with that of other means that purported to serve the same purpose; and next, the introduction of less costly and more easily applied stoves has since then kept the economic problem in an experimental stage of development, which has led the majority of iron masters to await in an attitude of observation the decisive solution of the problem, or the test of experience as to which means should prove the best and cheapest.

There has been little doubt entertained as to the possibility of economizing the present consumption of fuel. It is admitted that the heat now produced by 20 or 23 cwt. of coal or coke is about the minimum quantity required for smelting a ton of iron; but by the application of economizing apparatus, such as those which have exercised the scientific genius of Dr. Siemens, the requisite heat can be educed from a less quantity of coal, or the amount of heat contained in a ton of coal used in smelting may be utilized to a greater extent than it is at present by economizing the gases that have hitherto been wasted. This is the problem that is likely once more to engage the attention of the iron trade, both in this country and in England. Our requirements of coal for other purposes have been so steadily increasing, and the sensitiveness of the coal market has, consequently, become so much greater than was the case in any former period of our commercial history, that the less dependent our iron trade is upon our supply of coal, the better will be its prospects and its fortunes. Not only will the cost of iron be reduced in proportion as the consumption of coal in its manufacture is diminished, but its stability as a great and indispensable industry, upon which the success of other industries of a mechanical nature is, to a considerable extent, dependent, will be more sure and certain. It is not necessary, says the *Colliery Guardian*, to go back to the experience of 1872–3 to illustrate this feature of the trade. Illustrations of it will be continually occurring. This year, with all its abundance of coal supplies, and with all its distress among our mining population, has furnished two notable examples of how the one trade may be crippled or damaged through its dependence on the other. The great strike that occurred in the Durham coal field at the beginning of the year, and the lock-out that has occurred in Lanarkshire at the end of it, should help to impress upon the iron trade, not only the economy, but the policy of so utilizing to the utmost latent or wasted sources of heat as will place that industry on a sounder and surer footing. Like other trades, it has sometimes enough to do to adjust its own industrial problems, and to balance its own accounts, and so long as absolute dependence upon another industry is a condition, not only of its progress but of its existence, it cannot be considered in a safe position. Economy of fuel in the iron trade will not, in the long run, injure the coal trade; and its effect on the iron trade itself will increase both its profits and its security. If the saving which Dr. Siemens and Mr. Menelaus estimated there was room for were realized, it would represent something like 3,000,000 or 4,000,000 tons of coal per annum, and with the price of coal so rapidly rising, and the dependence of the iron trade so clearly demonstrated, the times seem to be ripening for such a long-delayed consummation.

To say anything of the waste of heat in coking is to repeat a thrice told tale; it has been admitted and deplored times without number, but nevertheless remains unremedied. In this branch of the iron trade there is room for a saving equal to at least 1,000,000 tons of coal per annum. A dozen years ago Mr. Isaac Lowthian Bell tried a successful experiment on this subject. He had a blast furnace erected on his coal-field, and attached to it an apparatus for heating the air by utilizing for that purpose the waste heat from the coke ovens. Experience in that case showed that the ovens required to make coke in that furnace were capable of supplying about two-thirds of the air heated to the proper temperature; in other words, there was a saving nearly equivalent to 300 weight of coal on a ton of iron. If this measure of economy were extended to all blast furnaces using coke, the total saving would be nearer 2,000,000 tons than 1,000,000 per annum. Yet this waste is continued. Results similar to that experienced by Mr. I. L. Bell have been obtained at Seraing and other Continental iron works, notwithstanding which we, with our more abundant supply of coal, allow it to go to waste. In a paper on the coke manufacture of South Durham in relation to the iron and steel trades, read by Mr. A. L. Stevenson, before the Iron and Steel Institute, at Newcastle, that gentleman gave some useful accounts of the application of the escaping gases from coke ovens to heating colliery boilers; and he calculated that, even by thus utilizing only 12½ per cent. of the heat from the waste gases of the coke ovens, if that comparatively small economy were adopted throughout the South Durnam coalfield, there would be a saving of 1,085,869 tons of coal per annum, representing a large sum of money which, in recent years of depression and loss, might as well have been realized. Of course these economies require some preliminary expenditure in plant or in structural alterations, which capitalists are unwilling to incur in periods of depression and gloom; but now that the commercial outlook has cleared up so suddenly, this subject may be opportunely brought under notice.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

A couple of experienced miners have reopened the West Wately lead mine with a force of 20 men.

J. Stevens & Co., the Chicopee pistol and gun makers, have begun the enlargement of their works which was contemplated for some time. Their business is increasing so fast that they will nearly double their capacity.

The walls for the foundry extension in the Lowell machine shop yard have been completed, and the roof is being put on.

Work is being pushed as fast as possible on the new silver plating works at New Bedford. The works will have a capacity for employing 200 hands, and it is believed by the projectors that within a year the factory will be running to its full capacity. Every branch of the business will be carried on upon the premises, from the preparation of the raw material to the last polish of the articles which fits them for the market.

The Union Cutlery Company, of Shelbourne Falls, consisting of Herbert B. Rowley, Walter T. Young, Edward Ritchie and George T. Drabble, have dissolved, and the works have stopped, preparatory to their removal to Greenfield.

Estabrook & Wires, screw manufacturers of Milford, are building an addition to their factory, 22 x 40 feet.

The imports at the port of Boston during the month of April was not exceeded by the aggregate value of the imports of all the Atlantic and Pacific ports, New York excepted.

CONNECTICUT.

The Hartford Steam Company have increased their capital stock from $50,000 to $100,000, and they will at once put up buildings and lay pipes. The system is not the Holly, but an adaptation, called the "Hartford" system.

The American Bicycle Company have been organized at New Haven with a capital of $10,000, of which $2500 is paid in.

NEW YORK.

The Silver Cliff Mining Company have ordered their second battery of boilers from Babcock & Wilcox, making 400-horse-power in all. As soon as these boilers are in place the company expect to increase their capacity to 70 tons of ore per day. The Trenton Iron Works, of Trenton, N. J., have just put in their second Babcox & Wilcox boiler of 60-horse-power, and are now running their Corliss engine from these two boilers. The engine is 20 x 42 inches, and makes 170 revolutions per minute. These boilers have also been ordered recently for the Empire, Ontario and Horn Silver Mines in Utah, the Plata Verde in Colorado, the Mohave in Arizona and the Chiahuahua and Guadaloupe mines in Mexico. The Penn Steel Company are also putting in 300-horse-power of these boilers.

PENNSYLVANIA.

The yield of iron at the blast furnace of the Warwick Iron Company for the week before last was 425 tons—the largest amount of iron that has ever been made by this furnace during any one week since it was put in blast the first time, and the largest yield of any furnace in the Schuylkill Valley. The best previous record of the furnace was 414½ tons, which was made some three months ago.

The foundation for the new pattern shop of the Reading Iron Works has been laid. The walls are 2 feet thick. It will be a two-story brick building, 146½ feet long by 60½ feet wide.

Twenty of the new coke ovens erected by the Cambria Iron Company, at Merrell, Fayette County, are now in operation.

No. 3 of the North Lebanon furnaces is being blown out. The furnace stands in need of repairs, and for this reason the fires have been drawn.

The new furnace at Dunbar, on the Baltimore and Ohio Railroad, will be blown in shortly. The old one was blown out some time ago.

On account of the breaking of one of the three-high rolls, all the departments of the Birdsboro Nail Factory are lying idle. Work will be resumed as soon as repairs can be made.

As a result of the change of gauge of the N. Y., P. & O. R. R., 100 locomotives will have to be built. Two-thirds of this number will be built in Meadville, the remaining third at Galion shops. All of these are to be completed within 15 months, and during that time will give employment to a largely increased force. Already the force in the boiler shops has been doubled, and new men are being employed rapidly.

The Pottstown Iron Company have started up their nail plate mill and nail factory, the extensive repairs having been completed.

On Wednesday, the 5th inst., just 16 days from the time the Western File Works were burned down, work was resumed at those works. The Beaver Valley *News* says: The *débris* is about all cleared away, and the temporary machine shop is completed and men at work in it (this shop will be used for other purposes as soon as the permanent machine shop is finished), and one or two small buildings are also inclosed and under cover. The main building will be 32 feet longer than the old one was, and two stories high, with an iron roof. The machine shop will be another two-story building, and twice the length it was before the fire. The blacksmith shop will be built of brick; before it was frame. There will be two large engines, one a 300-horse-power. The work of rebuilding is being pushed forward as rapidly as men can do the work.

It is reported that the engine house of the Rockland Furnace, recently put in blast, was destroyed by fire on Saturday, the 1st inst.

At the Atlantic Iron Nail Works of Kimberly, Carnes & Co., Sharon, all departments are shut down except the guide mill. There are some signs that the Keel Ridge Furnace—belonging to the above firm—is about to blow out. The Middlesex Rolling Mill is still idle.

Thomas Warner's French Creek Iron Works, at Warwick, Chester County, have suspended operations for the present on account of the overstocked market.

Stokes & Parrish, Philadelphia, have just completed and shipped a very powerful double steam furnace hoist for the Cambria Iron Co.'s new furnace at Johnstown. They are also busy on passenger and freight elevators, having orders from Cincinnati, O., Detroit, Mich., and other distant places. In Philadelphia, they are putting passenger elevators into the establishments of McCallum, Crease & Sloan and the Ridgway estate. Hydraulic elevators for Hood, Bonbright & Co., Young, Smith, Field & Co., and others. They are also building two shipping hoists for the Perth Amboy docks of the Lehigh Valley Railroad, besides numerous orders for miscellaneous work.

PITTSBURGH AND VICINITY.

The Empire Plow Works, Allegheny, are building an addition to their works.

H. C. Frick & Co. have ordered a discontinuance of work on all the new ovens which they had in course of construction in the Connellsville region, and have directed, further, that the ovens now in operation be drawn less frequently than heretofore, which will decrease the output. This may be considered as a direct result of the fall in iron, which has seriously affected the price of coke.

The Stewart Iron Company, of Sharon, which recently bought the Beeson farm, a mile east of Uniontown, and the coal underlying it, for the purpose of making their own coke, have abandoned for the present their project of erecting a large number of ovens.

The partnership existing between Messrs. W. Jarvis and W. C. Gray, under the name of Jarvis & Gray, brass founders, has been dissolved by the withdrawal of Mr. Jarvis. Mr. Gray has taken into partnership Mr. William M. Everson, and will carry on the old business under the firm name of Gray & Everson.

The plate department of the Superior Mill, Allegheny, has been put on single turn again.

Ten large locomotives (ten wheels each) are to be built at once at the Manchester Locomotive Works, for the Texas Pacific Railroad.

OHIO.

The manufacturing facilities at the old Perkins Engine Works, in North Toledo, now run by the American Machine Company, are being constantly extended. Seventy-five sets of machine castings are now turned out daily, employing 40 men. This shop supplies castings for the western trade of the company only.

The Cleveland Rolling Mill Company have increased their capital stock from $2,000,000 to $4,000,000.

The Diebold Safe and Lock Company, Canton, are building a large addition to their already extensive works, which, when completed, will afford them facilities for turning out 35 fire-proof safes per day, in addition to their burglar-proof safes and other work

The work of building the Nail City Glass Works, at Bridgeport, opposite Wheeling, was commenced on the 28th ult. The works will manufacture bottles and fruit jars exclusively. It is thought that they will be ready for melting glass by the middle of June.

The new glass house at La Grange is rapidly approaching completion. The stack is nearly up, and the frames of the buildings are all in position. The works will not be ready for operation by July 1, however, as desired.

Work has been begun on the new stack of the Ætna Glass Works at Bellaire. The furnace will have a capacity for 13 pots, and the stack, when completed, will measure 90 feet in hight.

Four switching engines have just been commenced at the shops of the Pittsburgh, Cincinnati and St. Louis road, Columbus. They are to be 14,000 pounds heavier than the four switching engines recently turned out of these shops and stand on six wheels. Engines of such capacity are needed at Indianapolis, Columbus, Bradford Junction and Pittsburgh, to handle long cuts or detached trains.

A telegram from Steubenville, dated May 9, says: This morning, about 3 o'clock, a frightful explosion occurred at the Steubenville Furnace, which will probably result in the death of Mr. Carsensten, an employee. Yesterday the work of blowing out the furnace was commenced, by the application of water on the bell, and about 3 o'clock this morning, while Mr. Carsensten was at his work on the top of the furnace, the water accumulated to such an extent as to force the bell down, letting a great quantity of water into the furnace and causing a terrible explosion. A large amount of the contents of the furnace was instantly forced out of the stack, causing a shower of fire to fall for some distance around the works and setting the hoisting house on fire. Carsensten is not expected to recover. The damage to the furnace cannot, at this writing, be estimated.

The work of reconstructing the old rolling mill at Wellsville is being pushed rapidly by the new proprietors—the Wellsville Plate and Sheet Iron Co.

Two boilers of the Grace Furnace, at Brier Hill, near Youngstown, exploded on the 30th ult., killing two employees and injuring several others. The cause of the explosion cannot as yet be ascertained. The loss, which is principally in the boiler and casting houses, is about $4000, fully covered by insurance.

The Bellaire Furnace has suspended work.

The Miller Chain Company are now the only manufacturers of chain at Akron. They occupy the works formerly owned and operated by Mr. Chevrier, who was one of the oldest chain manufacturers of this country. The Miller Chain Company make a specialty of coil, cable, trace and fancy chains, and manufacture a full line of agricultural chains. They employ about 100 hands, and at this time they are very busy, having orders far ahead of the present capacity of their works.

The Revolving Scraper Company, at Columbus, manufacturers of Doty's revolving road and lever scrapers; self-oiling railroad, canal and ore barrows and the "Mammoth Hard Pan Railroad Plows," are very busy in all the departments of their works. They are so pressed to fill contracts at this time for railroad barrows that they have ceased to solicit orders, but by recent arrangements for a largely increased capacity of their works, they hope to be able soon to fill all orders promptly. They have recently issued a new illustrated and descriptive catalogue and price list of their "Jacobs' Patent Wheelbarrows," comprising a great variety of barrows, among which they make the railroad and canal barrow, the ore or mortar barrow, the straight-handle stone barrow, the bent-handle stone barrow, the garden or farm barrow, and the off-bearing or green brick barrow, as leading specialties. These barrows are so constructed that they can be folded up so as to make a flat package, giving great facilty for shipment. The Jacobs patent wheel possesses many new features worthy of notice. It has ten spokes of thoroughly seasoned hard wood, the hub is of chilled cast-iron, and is riveted firmly to the spokes, which are so cut as to counterbrace each other, and are keyed from the center after the tire is shrunk on. It is claimed that this wheel will not shrink or give in any weather or climate, and consequently that the tire never gets loose, the wheel revolves on a fixed shaft or axle-bolt, which passes through the handles and is a brace to them. By a hole drilled in the hollow washer of the hub the oil is so distributed when the wheel is in motion, that the axle is completely lubricated. The company having recently constructed their new scrapers entirely of steel are meeting with heavy sales for that style, but keep on hand a supply of the old styles. Their new catalogue will be found of interest to dealers in this class of goods.

ILLINOIS.

Tuthill & Co., 51 South Jefferson street, Chicago, have recently begun the manufacture of wagon seat springs, with the most improved machinery, and every facility for making a superior spring. Their present capacity is about 1000 pairs a week.

The Columbia Iron Works, Chicago, are completing several linseed mills, an engine for a yacht and several large stationary engines. The establishment employs 50 men.

The Globe Foundry, Chicago, employing 22 men, have a casting contract for 500 tons of machinery for the new City Hall and for the State House at Lincoln, Nebraska.

Messrs. T. G. Perkins & Co., of Chicago, are building a four-ton steam hammer for a large Chicago concern. They are running their full force night and day, to keep up with their orders.

The Marine Engine Works, Chicago, are opening a new department for the manufacture of Jewelers' machinery. The establishment has large contracts for wire machinery and machinery for excursion boats at Lake Geneva.

VIRGINIA.

Quinnemont Furnace is in her eighteenth month of steady blast, and is doing well. Ferrol Furnace will go into blast as soon as her engine arrives.

Iron ore has been discovered on Bolivar Heights, Harper's Ferry.

Victoria Furnace, Louisa County, is to be put in blast soon.

It is rumored that two new blast furnaces are to be erected at Buchanan, Botetourt County.

WEST VIRGINIA.

The Central Glass Works, Wheeling, has not decided definitely what will be the size of its new furnace. One of the three old ones will be torn down to make room for it, and if sufficient space for a 15-pot foundation be thus cleared, that will be the size chosen. Otherwise a 13-pot furnace will be constructed.

MISSOURI.

The Jupiter Furnace, belonging to the Vulcan Steel Company, has blown in and is doing well.

The Excelsior Manufacturing Company, of St. Louis, intend to make an addition to their already extensive establishment by building another moulding shop, 72 x 137 feet. The cost will be about $8000.

What has Befallen the French Atlantic Cable?

There still seems to be some mystery as to the nature and cause of the accident that befell the French cable on the 1st of the month, interrupting telegraphic communication between St. Pierre and Brest. We have seen no authentic account of the extent of the damage or the distance from the shore end at which it occurred. But as it has been reported that the break was near St. Pierre, we might surmise that possibly it was caused by the deposition of heavy stones from the vast melting ice masses that have recently been moving over and east of the Grand Banks. The fracture of any of the Atlantic cables from this source is not impossible, and when the number and magnitude of the dissolving Greenland icebergs which sail over the sunken lines, transporting sometimes huge rocky masses, are considered, the wonder is that they have so long escaped injury from these masses as they descend to the ocean floor. Seamen in the presence of icebergs are not often in the mood of investigating these ugly and threatening monsters, and are glad to give them as wide a berth as possible, so that few are careful to observe whether they are laden with stony debris. As they are also frequently invested with fog and mist the extent to which they are freighted with the rocks of their native mountainous Greenland coasts is little known. But while emerging from the Artic seas and the Antartic Ocean icebergs have been seen transporting stones which, if dropped into the deep sea during the dissolution of the berg, could hardly fail to damage an underlying cable and break its electric current. Ross, in 1841, passed very close to a berg and boarded it, reporting "a large piece of rock upon it which must have been of many tons weight, and nearly covered with mud and stones." Redfield and Findlay mention an iceberg stranded in 1827 on the Newfoundland Banks in 80 fathoms of water, with large fragments of rock and quantities of earthy matter imbedded in its sides. And Lieutenant Payer, in 1873, in the Austrian Arctic expedition, met with a very large one weighted with "stones and pieces of rock on its broad back." Is it possible that one of these grand floating islands, bearing on its Atlean shoulders a cargo of Greenland bowlders, has dumped some of its ponderous freight on the French cable and ruptured its coating, destroying the insulation of its central wire? A satisfactory answer to this question and an explanation of the interrupted communication between St. Pierre and Brest will be looked for with no little interest.—*Herald.*

The Saharan Railway.—Three points on the coast of the Mediterranean have been proposed for the commencement of the line of railroad across the Desert of Sahara. Morocco, Algeria, and Tunis have each special recomendations, but there is a perfect unanimity of opinion regarding the expediency of making the route, from whatever place it is to be started, strike Insalah, a town which commands the whole line of traffic between the North and Timbuctoo. It is situated on the verge of the desert at the southern boundary of the French possessions in Northern Africa, and it is healthy and well supplied with water. The inhabitants have advanced far beyond the nomadic stage of civilization, and they are desirous of more intimate communication with still more civilized society.

The trade-mark bill which passed the House and is now pending in the Senate, is substantially in the form in which it was reported from the Committee on Judiciary, except that the penal clauses were stricken out. The bill provides that parties residing within the United States, or in a foreign country with which the United States has treaty regulations, may register trade-marks in the Patent Office on the payment of a fee of $25. This bill differs from the law declared unconstitutional by the Supreme Court, in that the law applied to commerce between the States, whereas the bill just passed applies only to the traffic between the United States and foreign countries, or with Indian tribes.

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Locomotives.
Porter, H. K. & Co., Pittsburgh, Pa. 18
Lubricator.
American Lubricator Co., Detroit, Mich. 29
Paul W. J., 218 Centre, N. Y.
Machinery, *Makers of.*
Bliss & Williams 167 Plymouth, Brooklyn 38
Box Alfred & Co., 312 Green, Phila. 39
Cooke Wm., 6 Cortland, N. Y. 39
Cuyahoga Works, Cleveland, Ohio 38
Landis Ezra F., Lancaster, Pa. 29
L. B. Flanders Machine Works, 1025 Hamilton, Phila. 36
Lyon E. & Co., 470 Grand, N. Y. 36
Forsaith S. C. & Co., Manchester, N. H. 38
Garvin E. E. & Co. 139 Center, N. Y. 39
Mohawk & Hudson Mfg. Co., Waterford, N. Y. 8
Oram & Atherton, Cleveland, O. 38
Pittsburgh Mfg. Co., Pittsburgh, Pa. 37
Pratt & Whitney Co., Hartford, Conn. 38
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y. 39
Stokes & Parrish, Philada., Pa. 38
The Stiles & Parker Press Co., Middletown, Ct. 38
Wetherill Robert & Co., Chester, Pa. 39
Machinery (Barnes's Foot Power.)
Little Chas. E., 59 Fulton, N. Y. 10
Machine Screws, *Makers of.*
Hartford Machine Screw Co., Hartford, Conn. 18
Fellows John, Williamsburg, N. Y. 16
Waterbury Mfg. Co., Waterbury, Conn. 2
Machinists' Tools.
Blaisdell P. & Co., Worcester, Mass. 37
Bullard E. P., 14 Dey, N. Y. 30
Cooke Wm., 6 Cortland N. Y. 39
Geo. Place Machinery Agency, 121 Chambers, N. Y. 30
Harrington E. & Son, 15th st. and Pennsylvania ave., Philadelphia Pa. 39
J. Gray Machinery Depot, 37 Dey, N. Y. 30
King J. M. & Co., Waterford, N. Y. 6
Marcellus C. N. & Co., 91 Liberty, N. Y.
North Selden G., Philadelphia, Pa 16
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y. 30
Stockwell Screw Machine Co., Cleveland, Ohio 38
Malleable Iron Castings, *Makers of.*
Hammer & Co., Branford, Conn. 25
Mallets.
N. Y. Handle and Mallet Works, 456 E. Houston 13
Penfield Block Works, Lockport, N. Y. 28
Manganese.
Pyrolusite Manganese Co., 54 Cliff, N. Y. 33
Measuring Tapes.
Eddy Geo. M. & Co., 353 Classon Ave., Brooklyn, N. Y. 10
Meat Chopping Machinery.
Murray Iron Works, Burlington, Iowa 25
Metals.
Dickerson, Van Dusen & Co., 29 and 31 Cliff, N. Y. 2
Goldsmith Moses & Son, Charleston, S. C. 3
Northrop A. C., Waterbury, Conn. 2
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Phosphor Bronze Smelting Co., 2038 Washington av., Phila. 35
Purves A. & Son, cor. South and Penn, Phila. 5
Quincy J. W., 98 William, N. Y. 6
Read D. W. R. & Co., 205½ Walnut, Phila. 5
Sellew R. & Co., St. Louis, Mo. 3
Schoenberg Metal Mfg. Co., 528 & 530 E. 20th, N. Y. 3
Starr John, Halifax, Nova Scotia 7
Metallurgists.
Booth, Garrett & Blair, 919 Chant, Philadelphia 5
Britton J. Blodgett, 330 Walnut, Philadelphia 6
Mica.
Peckham J. S. & M., Utica, N. Y. 16
Miners' Candles, *Makers of.*
James Boyd's Sons, 10 and 12 Franklin, N. Y. 38
Mine Lamps.
Leonard Bros., Scranton, Pa 18
Mineral Wool.
Elbers Alexander D., 26½ Broadway, N. Y. 31
Molding Sand.
Whitehead Bros., 517 W. 15th, N. Y. 2
Mouse Traps.
Dietz R. E., 54 and 56 Fulton, N. Y. 40
Jones Claudius & Co., Erie, Pa. 16
Ripley Mfg. Co., Unionville, Conn. 8
Nails.
Fuller Bros. & Co., 139 Greenwich, N. Y. 4
Oxford Iron Co., 81 Washington, N. Y. 4
Rowland Jas. & Co., 920 N. Delaware, Ave., Phila. 5
Schoenberger & Co., Pittsburgh, Pa. 4
Zug & Co., Pittsburgh, Pa. 4
Nail Machinery.
Pittsburgh Mfg. Co., Pittsburgh, Pa. 37
Nickel Platers' Supplies.
Condit, Hanson & Van Winkle, Newark, N. J. 28
Zucker & Levett, 540 to 544 West 16th st., N. Y. 27
Nippers.
Interchangeable Tool Co., 32 Howard, N. Y. 2
Norway Shapes, *Rollers of.*
Rowland Wm. & Harvey, Frankford, Philadelphia. 40
Nuts, Bolts, etc., *Makers of.*
Allentown Rolling Mill Co., Allentown, Pa. 5
Haskell W. H. & Co., Pawtucket, R. I. 37
Russell, Burdsall & Ward, Port Chester, N. Y. 40
Standard Nut Co., Pittsburgh, Pa. 37
Sternbergh J. H., Reading, Pa. 40
Oil, Lubricating.
Meriam & Morgan Paraffine Co., Cleveland, O. 33
Oil, Plumbago.
Plumbago Oil Co., Rochester, N. Y. 35
Oil Stones.
Boyd & Chase, 107th and Harlem River, N. Y. 32
Oil Stoves.
Vapor Oil Stove Co., Cleveland, O. 29
Ores.
Bingham C. E. & Co., Cleveland, O 6
Jackson Iron Co., Cleveland, O. 6
Llera J., 15 Dey, N. Y. 6
Pullman J. Wesley, 407 Walnut Philadelphia 5
Read D. W. R. & Co., 205½ Walnut, Philadelphia 5
Ox Shoes.
Greenfield Tool Co., Greenfield, Mass. 16
Ives, Woodruff & Co., Mount Carmel, Conn. 10
Packing.
Akron Rubber Co., Akron, O. 18
Katzenstein L. & Co., 35 Desbrosses, N. Y. 18
Patent Solicitors.
Howson & Son, Phila. and Washington, D. C. 8
Stetson Thomas D., 23 Murray, N. Y. 8
Tracy, Dyer & Wilber, Cleveland, O. 18
Pens, Steel.
Esterbrook Steel Pen Co., New York 9
Phosphor Bronze.
Phosphor Bronze Smelting Co., 2038 Washington ave., Philadelphia 35
Pianos.
Beatty Daniel F., Washington, N. J. 34
Picks, *Makers of.*
Pierson & Co., 24 Broadway, N. Y. 4
Pipes, Fittings, etc., *Makers of.*
McNab & Harlin Mfg. Co., 56 John, N. Y. 37
Pancoast & Maule, 227 Pear, Philadelphia 36
Pipe, Water and Gas, *Makers of.*
McNeal A. H. & Bro., Burlington, N. J. 6
Mellert Foundry and Machine Co., Limited, Reading, Pa. 16
Reading Iron Works, Philadelphia, Pa. 5
Wood R. D. & Co., 400 Chestnut, Philadelphia 29
Pistons, Steam Engine.
Sprague Wm. & Co., Philadelphia, Pa. 37
Plane Irons, *Manufacturers of.*
Buck Bros., Millbury, Mass. 10
Greenfield Tool Co., Greenfield, Mass. 16
Planes, *Manufacturers of.*
Greenfield Tool Co., Greenfield, Mass. 16
Stanley Rule and Level Co., 29 Chambers, N. Y 3
Plated Ware.
Hall, Elton & Co., 71 Chambers, N. Y. 11
The Wm. Rogers Mfg. Co., Hartford, Ct. 11
Plows.
Norwegian Plow Co., Dubuque, Iowa 18
Plumbers' Materials, *Manufacturers of.*
Carr Wm. S. & Co., 106 Center, N. Y. 37
Everhart Jas. M., Scranton, Pa. 40
Pocket Knives.
Boker Hermann & Co., 101 Duane, N. Y. 28
Pots and Kettles, Tea and Coffee.
Purvis R. C., Philadelphia 25
Sundry Mfg. Co., Buffalo, N. Y.
Power Hammers.
Dienelt, Eisenhardt & Co., Philada., Pa. 38
Forsaith, S. C. & Co., Manchester, N. H. 38
Presses, Fruit and Vegetable.
Mohawk & Hudson Mfg. Co., Waterford, N. Y. 8
Presses, Power, *Makers of.*
Bliss & Williams, 167 Plymouth, Brooklyn 38
Merriman A. H., West Meriden, Conn. 39
Peerless Punch & Shear Co., 52 Dey, N. Y. 39
The Stiles & Parker Press Co., Middletown, Ct. 28
Pulleys.
Penfield Block Works, Lockport, N. Y. 28
Providence Tool Co., Providence, R. I. 13
Pumps, *Makers of.*
Douglas W. & B., Middletown, Conn. 7
Gunnison A. B., Erie, Penn. 29
Hartford Compressed Air Pump Co., Hartford, Conn. 36
Philadelphia Hydraulic Works, Philadelphia 36
Rumsey & Co., Seneca Falls, N. Y. 7
Rumsey L. M. & Co., St. Louis, Mo. 36
Union Mfg. Co., 98 Chambers, N. Y. 7
Railroad Supplies.
Saxton & Pennell 91 William, N. Y. 29
Rails, Iron and Steel, *Makers of.*
Allentown Rolling Mill Co., Allentown, Pa. 5
Cambria Iron Co., Johnstown, Pa. 5
Cleveland Rolling Mill Co., Cleveland, Ohio 32
The Edgar Thomson Steel Co., 57 Broadway, N. Y. 33
Razors.
Tower L. C., Rochester, N. Y. 18
J. R. Torrey Razor Co., Worcester, Mass. 18
Refrigerators.
Jewett John C. & Sons, Buffalo, N. Y. 18
Rivets.
Gilmor Wm., of Wm., Baltimore, Md. 40
Grundy Geo. C., 165 Greenwich, N. Y. 29
Hoopes & Townsend, Philadelphia, Pa. 37
Townsend W. P. & Co. Pittsburgh, Pa. 37
Rock Breakers.
Blake Crusher Co., New Haven, Conn. 33
Farrel Foundry and Machine Co., Ansonia, Conn. 33
Gates & Scovill Iron Works, 52 Canal, Chicago 38
Totten & Co., Pittsburgh, Pa.
Rolls (Chilled).
Garrison A. & Co., Pittsburgh, Pa. 6
Rules, *Manufacturers of*
Stanley Rule and Level Co., 29 Chambers, N. Y. 3
Sad Irons.
Chalfant Mfg. Co., 435 Arch, Philadelphia 13
Enterprise Mfg. Co., Philadelphia 31
Sand and Emery Paper, *Makers of.*
Baeder, Adamson & Co., 730 Market, Philadelphia.
Saws, *Makers of.*
American Saw Co., Trenton, N. J. 36
Boynton E. M., 80 Beekman, N. Y. 40
Disston Henry & Sons, Phila. 19
Gerlach Peter & Co., Cleveland, Ohio.
Wheeler, Madden & Clemsen Mfg. Co., Middletown, N. Y. 36
Scales, *Manufacturers of.*
Buffalo Scale Co., Buffalo, N. Y. 13
Chatillon John & Sons, 91 Cliff, N. Y. 9
Howe Scale Co., Rutland, Vt. 11
Riehle Bros., 9th above Master, Phila. 25
Ross W. K., 95 Chambers, N. Y. 28
Southwark Hardware Co., Philadelphia 34
Screws, *Makers of.*
Billerbeck J., 17th and Venango Sts., Philadelphia 16
Miles F. S., 205 Quarry, Phila. 13
Philadelphia Screw Co., Philadelphia, Pa. 13
Screw Cutting Machinery.
Wiley & Russell Mfg. Co., Greenfield, Mass 34
Screw Drivers, *(Improved) Makers of*
Coulter, Flagler & Co., 87 Chambers, N. Y. 11
Disston Henry & Sons Phila 19
Scythes.
Beardsley Scythe Co., West Winsted, Conn. 18
Scythe Stones.
Pike A. F., Pike Station, N. H. 29
Second Hand Machinery.
Forsaith S. C. & Co., Manchester, N. H. 38
Shafting, Makers of.
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y. 39
Shears.
Henry Seymour Cutlery Co., 84 and 86 Chambers st., N. Y. 10
Renz Hardware Co., Bridgeport, Conn. 10
Shears, Iron.
Cleveland Hardware Co., Cleveland, O 18
Shears (Sheep).
Field Alfred & Co., 93 Chambers, N. Y. 10
Hildick A. H., 12 Warren, N. Y. 10
Shot, &c.
Sparks Thos. W., 121 Walnut, Philadelphia 25
Shovels, Spades and Scoops.
Griffiths Geo., Philada., Pa.
Groom Shovel Co., St. Louis, Mo. 34
Hussey, Binns & Co., Pittsburgh, Pa. 12
Shutters, Steel and Wood.
Clark & Co., 162 W. 27th, N. Y. 8
Sickle Grinders.
Powell & Douglas, Waukegan, Ill. 18
Sifters.
Hunter J. M. & Co., Cincinnati, O. 13
Smelting Works.
Philadelphia Smelting Co., 12th and Noble sts., Philadelphia 33
Reeves Paul S., 760 South Broad, Phila. 40
Snaths.
Vermont Snath Co., Springfield, Vt. 26
Speaking Tubes.
Ostrander W. R., 19 Ann N. Y. 18
Speiter.
Manning & Squier, 113 Liberty, N. Y. 2
Osgood F. & Co., Bergen Port, N. J. 18
Spiegeleisen.
Wright Peter & Sons, 52 Broadway, N. Y. 5
Spoons.
Holmes, Booth & Haydens, 49 Chambers, N. Y. .... 2&11
The Wm. Rogers Mfg. Co., Hartford, Ct. 11
Springs.
Cary & Moen, 234 W. 29th, N. Y. 3
Gautier Steel Co., Ld., Johnstown, Pa. .... 3&32
Rowland Wm. & Harvey, Frankford, Phila. 40
Semple & Birge Mfg. Co., St. Louis, Mo 29
Stamps, Steel.
N. Y. Stencil Works, 87 Nassau, N. Y. 8
Steam Boilers.
Babcock & Wilcox, 30 Cortlandt, N. Y. 38
Steam Hammers, &c., *Makers of.*
Dienelt, Eisenhardt & Co., Philadelphia, Pa. 38
Dudgeon Richard, 24 Columbia, N. Y. 9
Steam Pumps, &c., *Manufacturers of.*
Cameron A. S., East 23d, N. Y. 38
Clayton Steam Pump Works, 14 and 16 Water st., Brooklyn, N. Y. 40
Crane Bros. Mfg. Co., Chicago, Ill. .... 9&38
Davis I. B., Hartford, Conn. 29
Kelly Wm. E., 40 Cortlandt, N. Y.
McGowan John H. & Co., Cincinnati, O. 39
Storer G. W., 132 N. 3d, Philadelphia 39
The Norwalk Iron Works Co., So. Norwalk, Ct. 37
Steel Castings, *Manufacturers of.*
Chester Steel Castings Co., Evelina, Phila., Pa. 40
Eureka Cast Steel Co., Chester, Pa. 40
Flagg Stanley G. & Co., Philadelphia 40
Pittsburgh Steel Casting Co., Pittsburgh, Pa. 40
Steel Importers.
Carr J. & Riley, 30 Gold, N. Y. 32
Hobson Francis & Son, 97 John, N. Y. 32
McCoy & Co., 134 and 136 Duane, N. Y 10
Pierson & Co., 24 Broadway, N. Y. 4
Wolff, Kahn & Co., 46 Cliff, N. Y 32
Steel (Mushet's Special.)
Randall & Jones, 10 Oliver, Boston, Mass. 32
Steel Manufacturers.
Albany & Rensselaer Iron & Steel Co., Troy, N. Y. 32
Atha, Benjamin & Co., 211 Pearl, N. Y. 32
Cleveland Rolling Mill Co., Cleveland, O. 32
Gautier Steel Co., Ld., Johnstown, Pa. .... 3&32
Midvale Steel Works, Nicetown, Phila., Pa. .... 6&32
Miller, Metcalf & Parkin, Pittsburgh 32
Pennsylvania Steel Co., 208 S. 4th, Phila. 6
Rowland Wm. & Harvey, Frankford, Phila. 40
Sanderson Geo. & Co., 30 Gold, N. Y. 32
Smith, Sutton & Co., Pittsburgh, Pa. 32
Singer, Nimick & Co., Pittsburgh, Pa. 6
Spencer J. R. & Son, Sheffield, England 10
Standard Steel Works, Philadelphia, Pa. 5
The Edgar Thomson Steel Co., 57 Broadway, N. Y. 23
The Steel Co. of Scotland, 72 Pine, N. Y. 32
Wardlow S. & C., Sheffield, England 32
Steel Spiral Springs, *Manufacturers of.*
Cary & Moen, 234 W. 29th, N. Y. 3
Chatillon John & Sons, 91 and 93 Cliff, N. Y. 9
Steel Tube Cleaners.
The Chalmers-Spence Co., foot 9th St., E. R., N. Y. 16
Steeline.
Bauer & Co., 96 Greenwich Ave., N. Y. 32
Stocks and Dies.
Holroyd & Co., Waterford, N. Y. 36
Wiley & Russell Mfg. Co., Greenfield, Mass. 34
Stove Boards, *Manufacturers of.*
Ansonia Brass and Copper Co., 19 and 21 Cliff, N. Y. 9
Stove Trucks.
Tucker Alarm Till Mfg. Co., Indianapolis, Ind. 10
Strops, Razor.
Copeland, Hall & Co., Rochester, N. Y. 29
Torrey J. R., Worcester, Mass. 18
Stump Puller.
Burger M. E. & Co., Indianapolis, Ind 10
Tacks.
American Tack Co., Fairhaven, Mass. 8
Dunbar, Hobart & Whidden, 39 Warren, N. Y 7
Field A. & Sons, Taunton, Mass. 9
Grundy Geo. C. 165 Greenwich N. Y 29
Shelton & Co., Birmingham, Ct.
Taps and Dies.
Carpenter J. M., Pawtucket, R. I. 40
Manning H. S. & Co., 111 Liberty, N. Y. 25
Wiley & Russell Mfg. Co., Greenfield, Mass. 34
Thermometers.
Tower L. C., Rochester, N. Y 18
Tin Plate, *Importers of*
N. & G. Taylor Co. Philadelphia 3
Tin Plate, *Manufacturers of.*
U. S. Iron and Tin Plate Co., Pittsburgh, Pa 4
Tin Ware, Stamped and Japanned
Block David, 69 Bayard, N. Y. 31
Haberman F., 294 Pearl, N. Y. 25
Shepard Sidney & Co., Buffalo, N. Y.
Vogel William, Brooklyn, E. D., N. Y. 4
Tire Upsetter.
Little Giant Mfg. Co., Millport, N. Y. 29
Tissue Paper, Anti-Tarnish Silver.
Butler, Jr., H. V. & Co., 34 Reade, N. Y. 40
Tool Chests.
American Tool Co., 116 Chambers, N. Y.
Tools, Steam and Gas Fitters.
Saunders' Sons, Yonkers, N. Y.
Transportation Lines.
The Iron Line, 33 Coenties Slip, N. Y. 18
Trowels.
Bruce Geo. W., 1 Platt, New York 29
Try Squares, Bevels, &c., *Makers of.*
Disston Henry & Sons, Phila. 19
Tube Expanders.
Dudgeon Richard, 24 Columbia, N. Y. 9
Tubing.
Merchant & Co., 507 Market, Phila. 31
Twist Drills, *Makers of.*
Morse Twist Drill & Mach. Co., N. Bedford, Mass. 8
Upholsterers' Goods.
Turner & Seymour Mfg. Co. 81 Reade, N. Y.
Valves, Gas, Water and Steam.
Ludlow Valve Mfg. Co., Troy, N. Y. 38
Mohawk & Hudson Mfg. Co., Waterford, N. Y. 8
Varnish.
Berry Brothers, Detroit, Mich. 7
Vises.
Hall Mfg. Co., 23 Dey, N. Y. 8
Millers Falls Co., 74 Chambers, N. Y. 25
Watchmen Furnished.
Van Hoesen & Bro., 67 South, N. Y. 12
Wheels, Railroad.
Whitney A. & Sons, Philadelphia 6
Whetstones.
Pike A. F., Pike Station, N. H. 29
White Lead.
Brooklyn White Lead Co., 89 Maiden Lane N. Y. 34
Colgate Robert & Co., 287 Pearl, N. Y. 34
Jewett John & Sons, 182 Front, N. Y. 34
Lewis John T. & Bros., 231 S. Front, Phila., Pa. 34
Window Balances.
Hugunin Robt. B., Wethersfield, Conn. 39
Window Springs, *Makers of.*
Hammond W. S., Lewisberry, Pa. 18
Wire, *Manufacturers of.*
Cary & Moen, 234 W. 29th, N. Y. 3
Cleveland Rolling Mill Co., Cleveland, Ohio 32
Gautier Steel Co., Ld., Johnstown, Pa. .... 3&32
Gilbert & Bennett Mfg. Co., 273 Pearl, N. Y. 7
Griswold J. Wool, Troy, N. Y. 2
Harrison Wire Co., St. Louis, Mo. 2
Howard & Morse, 45 Fulton, N. Y. 2
Prentiss Geo. W. & Co., Holyoke, Mass 2
Trenton Iron Co., Trenton, N. J. 2
Washburn & Moen Mfg. Co., Worcester, Mass. 2
Wire Goods, *Manufacturers of.*
Dufur & Co., 36 N. Howard st., Baltimore, Md. 3
Gilbert & Bennett Mfg. Co. 273 Pearl, N. Y. 7
Tate & Co., Boston, Mass.
Wire Nails.
American Wire Nail Co., Covington, Ky. 23
Dunbar, Hobart & Whidden 39 Warren, N. Y. 7
Field A. & Sons, Taunton, Mass. 9
HP. Nail Co., Cleveland, Ohio. 28
Wire Rope, Iron and Steel, *Makers of.*
Broderick & Bascom, St. Louis, Mo. 2
Hazard Mfg. Co., Wilkesbarre, Pa. 2
Roebling's John A. Sons, Trenton, N. J. 2
Wrenches, *Manufacturers of.*
Bemis & Call Hdw. & Tool Co., Springfield, Mass .... 25&33
Coes A. G. & Co., Worcester, Mass. 13
Coes L. & Co., Worcester, Mass. 25
Girard Wrench Mfg. Co., Girard, Pa. 6
Wood Working Machinery.
Forsaith, S. C. & Co., Manchester, N. H. 38
Wringers.
Alexander T. J., Boston, Mass. 10
Metropolitan Washing Machine Co., 52 Cortlandt, N. Y. 37
Peerless Wringer Co., Cincinnati, O.
Zinc.
Hart Lucius & Co., 8 Burling Slip, N. Y. 3

NEW YORK WHOLESALE PRICES, MAY 12, 1880.

METALS.

IRON.—DUTY: Bars, 1 to 1¼c. ₩ ℔; Sheet, Band Hoop and Scroll, 1¼ to 1¾c. ₩ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ ℔; Wrought Scrap, $6 ₩ ton; Cast Scrap, $6 per ton. Railroad 70c. ₩ 100 ℔s. Boiler and Plate, 1¼c. ₩ ℔.

Pig Iron—AMERICAN.

Foundry No. 1	(Nominal.)	₩ ton $26.00 @ 28.00
" No. 2X	"	₩ ton 25.00 @ 27.00
Gray Forge	"	₩ ton 25.00

SCOTCH.

Eglinton	₩ ton 21.00 @ 22.00
Coltness	₩ ton 24.00 @ 24.50
Glengarnock	₩ ton 22.00 @ 23.00
Gartsherrie	₩ ton 22.00 @ 23.00

Rails.

Iron (nominal)	₩ ton $55.00 @ 60.00
Steel (nominal)	₩ ton 65.00 @ 70.00
Old Rails Ts (nominal)	₩ ton 26.00 @ 27.00

Scrap.

Wrought Scrap ₩ ton (nominal) ..... 27.00@28.00

Bar Iron, from Store.—Nominal Prices.

Common Iron:
¾ to 2 in. round and square } ₩ ℔ 2.80
1 to 6 in. x ¾ to 1 in. }
Refined Iron
¾ to 2 in. round and square } ₩ ℔ 3. c
1 to 6 in. x ¾ to 1 in. }
1 to 6 in. x ⅛ and 5-16 ₩ ℔ 3.20
Rods—¾ and 11-16 round and square ₩ ℔ 3.70
Bands—1 to 6 x 3-16 to No. 12 ₩ ℔ 3.70
Norway Nail Rods 7. c

Sheet Iron.

Nos.	Common American	R. G. American.
10 to 20	₩ ℔ 4¾ @	5¾
21 to 24	₩ ℔ 4¾ @ c	6
25 to 26	₩ ℔ 5¼c	6¼
27	₩ ℔ 5½c	6⅛
28	₩ ℔ 5¾c	7

Galvanized,	B.B.	2d qual.
10 to 20	₩ ℔ 9 c	8 c
" 21 to 23	₩ ℔ 10 c	9 c
" 25 to 26	₩ ℔ 11 c	10 c
" 27	₩ ℔ 12 c	11 c
" 28	₩ ℔ 13 c	12 c

Patent Planished ₩ ℔ A. 13c; B. 11¾c
Russia 14@15 c
American Coin Rolled ₩ ℔ 7@7½c

COPPER.—DUTY: Pig, Bar and Ingot 1, 1c; Old Copper 4c ℔; ₩ Manufactured (including all article of which Copper is a component of chief value), 45 % ad valorem.

American Ingot ₩ ℔ See Trade Report.

SHEATHING, BRAZIERS' COPPER, BOLTS, &c.

Braziers' Copper, ordinary sizes, 160z. per sq. ft., and over per lb 31c
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz., ₩ sq. ft. ₩ ℔ 33c
Braziers' Copper 10 oz and 12 oz., ₩ sq. ft. ₩ ℔ 34c
" Lighter than 10 oz. ₩ sq. ft .. ₩ ℔ 37c
Circles less than 84 in. in diameter ₩ ℔ 34c
Circles 84 in. diameter and over ₩ ℔ 37c
Segment and Pattern Sheets ₩ ℔ 34c
Locomotive Fire Box Sheets ₩ ℔ 31c
Sheathing Copper, over 12 oz. ₩ sq. ft. ₩ ℔ 39c
Bolt Copper ₩ ℔ 31c
Copper Bottoms ₩ ℔ 34c
No Copper is Sheathing except 14, 18 inches and not to exceed 34 oz. to the sq. ft.

TINNING.

14x48 ₩ sheet 6c
All other size Sheets, 2½c. per square foot.
For tinning both sides, double the above amount
O'REILL'S PATENT PLANISHED COPPER.—Net.

14 and 16 oz. and heavier	₩ ℔ 38c By the case. ₩ ℔ 37c
12 oz. and lighter	₩ ℔ 41c " " ₩ ℔ 40c

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. ₩ ℔ 40c By the case. ₩ ℔ 39c
(And all sizes not over 20 in. wide.)
30x00.
14 and 16 oz. and heavier ₩ ℔ 42c
12 oz ₩ ℔ 45c

Brass.

Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.—dis 20%. Jan. 14, 1880.

Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ₩ ℔.

HIGH BRASS.

All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in 32c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive 37c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive 40c
½c. ₩ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at... 49c
Sheets 24x48 and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in. 39c
Printers' Rules 47c
Sheets wider than 30 in. and under 40 in 49c
" 40 in. and over 52c
Circular Sheets, in diam. from 4 in. to 14, inclusive. 12c
" " over 14 " 20, " 47c
" " " 20 " 30, " 41c
" " " 30 " 40, " 57c
" " " 40 in. 61c

LOW BRASS.

4c ₩ ℔ more than High Brass.
Gilding Metal, 8c ₩ ℔ more than High Brass.
Platers' or Gold Metal { In Bars 50c; Sawed 54c; Planed or Polished 56c

FOR SLITTING.

Metal in width 2 in. to ⅛ in. to No. 28, inclusive, 1c. ₩ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width 1 in. to ⅛ thinner than No. 28, 3c ₩ ℔ advance
Metal, in width ⅛ in. to ¼, inclusive, not thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width ⅛ in. to ¼ thinner than No. 28, 3c. ₩ ℔ advance.
Metal, ¼ in. in width and less, 10c. ₩ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ₩ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 inch, to No. 26	$0.52	$0.70
6 " " "	.56	.76
10 " " "	.64	.88
15 " " "	.74	1.03
18 " " "	.80	1.12

German Silver Sheets over 12in. wide and weighing more than 10 ℔s., $2.00 ₩ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ₩ ℔ on each No. thinner than Nos. 26 to 36, inclusive
All German Silver thinner than No. 36 is Platers, at 50c ₩ ℔ additional.
German Silver Scrap one-half less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.35	$0.39	$0.45
No. 21	.38	.42	.48
No. 22	.39	.43	.49
No. 23	.41	.44	.50
No. 24	.42	.46	.52
No. 25	.45	.49	.55
No. 26	.47	.51	.57
No. 27	.50	.53	.60
No. 28	.54	.58	.65
No. 29	.57	.61	.68
No. 30	.60	.64	.74
No. 31	.64	.68	.80
No. 32	.68	.72	.86
No. 33	.72	.76	.95
No 34	.79	.80	1.04

Spring Wire 2c ₩ ℔ advance.
Flat, Square and Half Round Wire 4c ₩ ℔ advance on Round Wire.
Fancy Wire not less than 10c ₩ ℔ advance of Round Wire.
Brass Rods, No. 8 and larger not less than 2 feet lengths, 40c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 45c.
Wire and Rods less than 2 feet lengths, special rates
Twelve cents per ℔ extra for spooling on 1 ℔ spools.

MISCELLANEOUS.

Brass Pail Ears $0.42
Brass Door Rail 48

SCRAP.—net.

High Brass Scrap 14c
Low " 16c
Gilding 18c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis 20 %

	₩ ℔
Plain No. 2 inclusive above ¼ in. to 3 in.	$0.45
" above 3 in.	.55

Nos. 21, 22, 23, two cents advance on List for each Number.
Os. 24, 25, 26, four cent advance on List for each Number.
Above No. 26, special rates.

Plain, ¼ inch	.72
5-16 "	1.12
⅜ "	1.62

All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20 42c
English, Scotch and Extra Patterns Fancy Tubing to No. 20 57
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ⅛ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance.

ZINC TUBING.—net

Plain	.29
Fancy	.35
Scotch and Extra Patterns	.38

GERMAN SILVER TUBING.—dis 10 %

4 Per cent.	.80
6 "	.90
9 "	1.05
12 "	1.20
15 "	1.35
16 "	1.40
18 "	1.50
20 "	1.60

STEEL.—DUTY: Bars, Ingots, Sheets and Coils valued at 7 cents ₩ ℔., or under, 2½ cents; over, 7 cents, and not above 11, 3 cents ₩ ℔; over 11, 3½ cents ₩ ℔., and 10 % ad val. Railway Bars, 1¾ cents ₩ ℔. Railway Bars, in part Steel, 1 cent ₩ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

For American Steel see quotations under heading of Pittsburgh.

English Steel.—

" Best Cast	₩ ℔ 15½c
" Extra Cast	₩ ℔ 16½c
" Round Machinery, Cast	₩ ℔ 10c
" Swaged, Cast	₩ ℔ 18c
" Best Double Shear	₩ ℔ 15½c
" Blister, 1st quality	₩ ℔ 13c
German Steel, Best	₩ ℔ 11c
" 2d quality	₩ ℔ 10c
" 3d quality	₩ ℔ 9c
Sheet Cast Steel, 1st quality	₩ ℔ 15½c
" 2d quality	₩ ℔ 14½c
" 3d quality	₩ ℔ 12½c

ANTIMONY ..... See Trade Report.

LEAD.—DUTY Pig $2 ₩ 100 ℔s: old Lead, 1½c ℔ ₩ Pipe and Sheet, 2½c ₩ ℔.

American	5¾ @ 6 c
Bar	7½c dis 10 %
Pipe	8c dis 10 %
Tin Lined Pipe	14c. dis 10 %
Sheet	8½c. dis 10 %
Shot Drop 9½c. Buck. 10½c. dis 10 %	
Chilled Shot	10½c. dis 10

BABBITT METAL.

N. P. U. ₩ ℔ 7 @ 8c
A. 20c: B, 16c: C, 12c.

TIN.—DUTY: Plates, Sheets, Tagger and Terne, 1.1c ₩ ℔; Electro-galvanized Plates, 2c ₩ ℔: Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent

Banca	₩ ℔ 24c @
Straits	₩ ℔ 21c @
English	₩ ℔ 20c @

TIN PLATES.

I C 10X14 } 14X20 }	Prime Charcoal	$8.00 @ 8.50
I C 12X12	"	8.25 @ 8.75
I X 10X14 } 14X20 }	Charcoal	10.00 @ 10.50
I X 12X12	"	10.75
D C 12¼X17		7.50 @ 8.00
D X 12¼X17		9.50 @ 10.00
For each additional X add		2.00

COKE TIN PLATE.

	Best.	2d quality.	Ordinary
I C 10X14 } I C 14X20 }	$7.50	6.75 @ 7.00	6.00 @ 6.50
I C 12X12	7.75	7.00 @	6.25 @ 6.75

TERNE PLATE

	Prime Char.	2d qual.	Coke.
I C 14X20	$7.25	7.00 @	6.50 @ 7.00
I X 14X20	9.25	....	...
I C 20X28	15.00	14.00 @ 14.50	13.50 @ 14.00
I X 20X28	19.00	....	...
I C 20X200	24.00	....	....
I C 14X20 M. F. Brand			9.75 @

SOLDER ..... No. 1 12c @ 13c; No 2. 11½c

SPELTER—DUTY: In Pigs, Bars and Plates, $1.50 ₩ 100 ℔s.

American, cash	6¼ @ 6¾c
Bergen Port from Lehigh Ore	10c
Lehigh, on spot	9c

ZINC.—DUTY: Pig or Block, 1.50 ₩ 100 ℔s. Sheet, 2½c ₩ ℔.

Sheet, Cask	8
" Open	8½ 9c

Paper Stock, &c.

(Dealer's Selling Price.)

Canvas linen	@ 5
White cotton, new	5 @
" " No. 2	3½@
White linen rags No. 1	5 @
" No. 2	3 @
Seconds	2 @
Soft woolens	11 @
Gunny bagging	3¾ @
Jute Butts	3 @ 3½
Kentucky bagging	3 @
Waste paper and scraps	1 @ 1¼
Rope cuttings	1¼ @ 3
Kentucky bale rope	4 @ 4½
Grass rope	3½ @ 3¾
Tarred shaking	1¾ @
Hard White Shavings, No. 1	4½ @ 4¾
Soft " " No. 1	4 @ 4½
White Shavings, No. 2	3¾ @
Mixed " part white	3¼ @
Imperfections, No. 2, best folded sheets	3¼ @
" No. 1. Heavy Stock	3¼ @
Book Stock	3½ @ 3¾
" Heavy	3¾ @ 4
" Light	1½ @ 1¾
Newspapers	2½ @ 3
Prints	1½ @
Pure Manilas	3 @ 3¼
Bogus Manilas and Hardwares	$1.40 @
Commons	70 @
Binders' Board Cuttings	90 @
Straw Board Cuttings, clean	75
Woolen Tailor Clips	18 @ 19
Satinet	2½ @ 3½

Paints, Oils, &c.

Paints.

Black Lamp, Coach Painters	₩ ℔ 2.0
" Ordinary	.60
" Ivory Drop, fair	.12 @ 14c
" best	2c
Black Paint, in oil kegs 8c asst'd cans, 11c	
Blue Prussian, fair to best	40 @ 44c
" " in oil	45 @ 55c
Blue Chinese dry	8@
" Ultramarine	18 @ 20c
Brown, Spanish	14c
" Van Dyke	10@12c
Carmine, 40	combination price
Green, Chrome	18 @ 23c
" " in oil	14 @ 18 @ 20c
" Paris good, 25c; best, 30c	
" " in oil 30c;	44c
Iron Paint, Bright Red	₩ ℔ 2½c
" Red	₩ ℔ 2c
" Brown	₩ ℔ 2½c
" Purple	₩ ℔ 3c
" Ground in Oil, Bright Red	₩ ℔ 4½c
" " Red	₩ ℔ 5c
" " Brown	₩ ℔ 4½c
" " Purple	₩ ℔ 5c
Mineral Paints	1¼ @ 4c
Orange Mineral	10c
Red Lead, American	7½c
" English	none in market
" Venetian (N. C.) dry	$1.65 @ $1.70
" " in oil asst'd cans, 11c; Kegs, 8c	
" Indian dry	9 @ 12c
Rose Pink	10 @ 13c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	10 @ 16 @ 20c
" Raw	11 @ 15 @ 25c
" Raw in oil	4 @ 8c
Umber, Burnt	9 @ 12 @ 16c
" " in oil	3½ @ 7½c
" Raw	10 @ 16 @ 18c
" " in oil	9c
Vermillion, Chinese	60 @ 62½c
" English	1.10c
" Trieste	11c
" American, Common	27@
White Lead, American, pure dry	8¼c
" " in oil	9 to 9½c
White, Paris, English, prime in bbls. 2 @ 2½c	
Yellow Ochre, French	$1.75
" " in oil asst'd cans, 11c; kegs, 8c	
" " Vermont in casks, 1½c	
Yellow Chrome	17 @ 27c
" " in oil	14 @ 18 @ 25c
Zinc White American No. 1, dry	5 @ 5½
" " No. 1, in oil	9c
" French (Paris)	8 @ 10c
" " in oil	@ 10c

Oils.

Linseed, Raw, in casks and bbls	₩ gal. 67c
" Boiled " "	83c & 85c
Bleached Whale	₩ gal. 65c
" Sperm	₩ gal. $1.20
" Elephant	65c
Signal	54c
Prime Lard	58c
No. 1	53c
West Virginia	16c @ 22c
Drilling	40c
Empire Cylinder	34c
Miners' Oil	38 to 46c
Fish Oil, pressed	44c
Neatsfoot	73c
Tallow	6½c
Machinery	40c
Engine	40c

Sundries.

Asphaltum	9c
Benzine	₩ gal 16c
Chalk	3½c
" Block	3½c
Dryer, Patent, Am'n asst cans, 10½c; keg, 9c	
Frostings	40c
Glue, White	33 @ 44c
" Sheet	20c
Glaziers' Points, Zinc	8c
Gum, Copal	36c
" Damar	21c
" Shellac, English	40c
" " dark	38c
Litharge, English	7½c
Mineral Wool	₩ ℔ 1¼ @ 1½c
Pumic Stone, selected Lumps	4 @ 6c
" powdered	2½c
Putty, in bladders	3 c
" in bulk	2½c
Rotten Stone, soft, English	—
Spirits Turpentine	35c
Whiting Spanish	¾c

Glass.

FRENCH WINDOW GLASS.

Prices current per box of 50 feet.

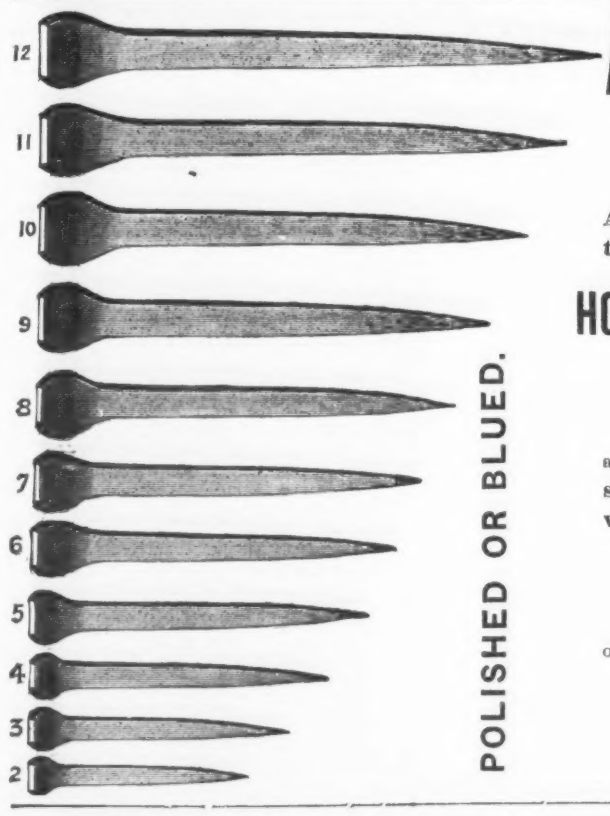
Single Thick.—Discount 40 to 40 & 10 %

SIZES.	1st.	2d.	3d.	4 th
6 x 8 to 10 x 15	$ 8.00	$ 6.75	$ 6.25	$ 4.75
11 x 14 to 16 x 24	8.75	8.00	7.50	7.00
18 x 22 to 20 x 30	11.25	10.50	9.75	8.75
15 x 36 to 24 x 30	12.75	11.50	10.00	
26 x 28 to 24 x 36	13.50	12.25	11.25	
26 x 36 to 26 x 44	14.75	13.75	11.75	
26 x 46 to 30 x 50	16.25	15.00	13.00	
30 x 52 to 30 x 54	17.25	16.00	13.50	
30 x 56 to 34 x 56	18.25	16.75	15.00	
34 x 58 to 34 x 60	19.50	18.00	16.00	
36 x 60 to 40 x 60	21.00	19.50	18.00	

Double Thick.—Discount 60 to 60 & 5 %

SIZES.	1st.	2d.	3d.	1 lb.
6 x 8 to 10 x 15	$12.00	$11.00	$10.00	$ 9.25
11 x 14 to 16 x 24	14.75	13.75	12.75	11.75
18 x 22 to 20 x 30	19.00	17.75	16.00	
15 x 36 to 24 x 30	21.50	19.25	16.50	
26 x 28 to 24 x 36	23.00	20.75	18.25	
26 x 36 to 26 x 44	24.00	23.00	19.25	
26 x 46 to 30 x 50	27.00	25.00	21.25	
30 x 52 to 30 x 54	28.50	26.00	22.25	
30 x 56 to 34 x 56	30.00	27.75	24.75	
34 x 58 to 34 x 60	31.75	30.00	27.00	
36 x 60 to 40 x 60	35.00	32.50	30.25	

Sizes above 40 x 60—$10.00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches will be charged in the 84 united inches bracket



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AUSABLE HORSE NAILS,

Hot Forged and Cold Hammered Pointed,

Are the **only Nails in market** that are made in imitation of the **Hand Process.** They have **the uniformity of Machine** Nails and the **toughness** of those hammered by hand. Our

HOT FORGED AND COLD HAMMERED POINTED NAILS

Are the Standard Nails,

and are **acknowledged to be the best in the market.** They are used by the **best shoers** in **New York, Brooklyn, Philadelphia, Chicago, Saint Louis, Milwaukee, Baltimore,** &c., and

GENERALLY THROUGHOUT THE UNITED STATES.

They also compete successfully in Foreign Countries with machine and hand-made Nails of their own manufacture.

AUSABLE HORSE NAIL CO.,

4 Warren St., New York.

Twisted, Bent and Drawn COLD.

MILLER'S NO. 13 LANTERN

Gives more light and will hold the flame more perfectly than any other Lantern made.

For Prices and Samples, address

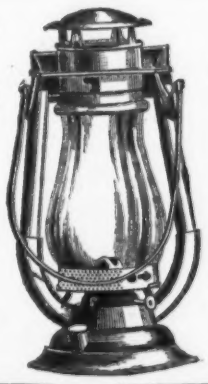
Edw'd Miller & Co.,

Meriden, Conn.,

OR

35 Warren St.,

New York.



Manufacturers of

Lanterns,
Brass Kettles,
Machine Oilers,
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&c., &c.

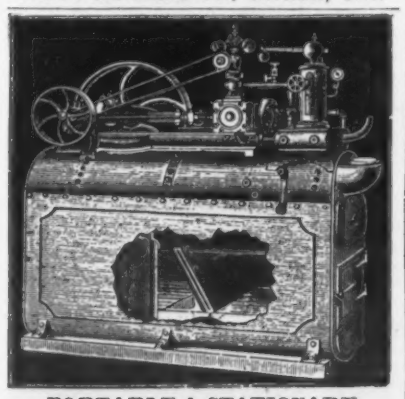
THE ECONOMIC PATENT BOILER FEED PUMP, I. B. DAVIS, Maker, Hartford, Conn. Send for Circular.

SOLDERING FURNACE. Price, $8.

This improved furnace burns coal oil (kerosene) of any grade without smoke or odor, heating coppers equal to, or better than, charcoal. The fire is lighted in less time, and is as easily controlled as a lamp Those doing piece work find this greatly to their advantage. We have letters from manufacturers who have thoroughly tested it with coppers of all sizes, saving, "We get a saving of 25 per cent. over charcoal in its use." Any one ordering a furnace C. O. D., or with money inclosed, if not as represented, money, less freight, refunded.

Send for circulars of stoves and torches. Address,

VAPOR OIL STOVE CO., Cleveland, Ohio.



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ENGINES and BOILERS,

2½ to 15 H. P.

Return Flue Boiler, large Fire Box, no sparks. Do not fail to send for circular to

SKINNER & WOOD, Erie, Pa.

PRESSED STEEL GEARING.

Most powerful, accurate, durable and cheapest. Any shaped teeth.

J. COMLY, Patentee,
LINCOLN PARK, N. J.

SEND FOR PAMPHLET. THE FAR-FAMED **AMERICAN LUBRICATOR.** TEN THOUSAND IN USE.

AMERICAN LUBRICATOR CO.
DETROIT, MICH. U.S.A.

STAR LOCK WORKS.

ESTABLISHED 1836.

Trunk Locks, Door Springs,
Pad Locks, Trunk Stays,
Dead Latches, Keys, &c., &c.

110 South 8th St., and Sansom, bet. 8th and 9th, PHILADELPHIA.

PATENTED

Scand. Pad Locks. With Flat Keys.

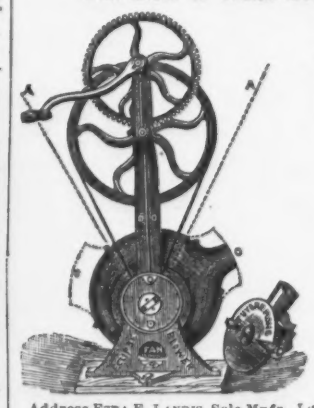
Shackel secured to the Lock Box.

HILLEBRAND & WOLF.

THE IMPROVED

ECLIPSE FAN BLOWER,

With Lever or Crank Motion.



Acknowledged as the best, is guaranteed as represented. Shop prices: Crank Motion, Tuyere Iron, &c., $27.00; Crank and Lever Motion, Tuyere Iron, &c., $30.00. The trade are invited to write for circulars, terms, &c., as sales are solicited only through them.

Address EZRA F. LANDIS, Sole Mnfr., Lancaster, Pa., or the principal offices: W. C. Duyckinck, New York City; Jos. Schwartz & Co., New Orleans, La.; Sligo Iron Stove Co., St. Louis, Mo.; S. D. Kimball, Chicago, Ills.; Stevens & Garrigues, Leavenworth, Kan.; Theo. W. Herr, Denver, Col.; W. J. Halliday & Co., Indianapolis, Ind.; Huntington, Hopkins & Co., Sacramento, Cal.; T. Moore, Sydney, N. S. W., Australia, or Pfeil, Stedall & Son London, England.

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Manufacturers of Copper, Brass, and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails &c. Rivets made to Order.

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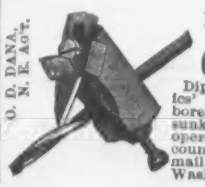

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BARBER'S PATENT **COUNTERSINK.**

Diploma awarded at Mechanics' Fair, Boston, 1876. Hole bored any depth, and countersunk for any size screw at one operation. $2 per doz.; discount in quantity. Sample by mail 30 cts. D. F. BARBER, 1321 Washington St., Boston.

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MANUFACTURER OF

WOOD PUMPS

ERIE, PA.

ESTABLISHED, - 1836.

Warranted Genuine

Cucumber Pumps & Pipe. Also Poplar Pumps, Lined Pumps, &c.

The Trade Supplied by
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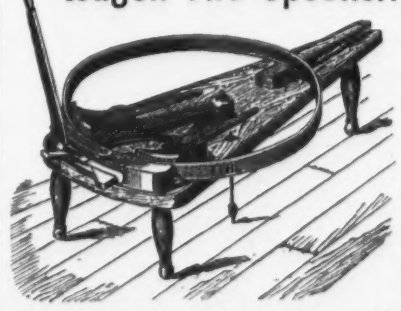
P. MANN, Washington, D. C.
KIRK & DICKSON, New Castle,
KNECHT & THOMAS, Winchester, Ind.

—AND BY—

A. B. GUNNISON
Manufacturer.
ERIE, PA.

LITTLE GIANT

Wagon Tire Upsetter.



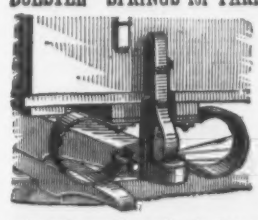
This Machine is strong, durable and cheap, and is superior to all others for upsetting or shrinking wagon tires and bars of iron without cutting them. It will upset tires one inch at a heat, and is adapted to tires of any size or diameter. Every Blacksmith should have one; they are the best selling machines Hardware merchants and Agents ever handled.

Price only $12.00. Send for Circular.

LITTLE GIANT MFG. CO.,
Millport, Chemung Co., N. Y.

SOMETHING NEW!

PULLIAM'S PATENT BOLSTER SPRINGS for FARM WAGONS.



This valuable device is suited to wagons of any size—made of the best steel and warranted—are attached by four bolts through the bed—can be put on by any person. They remain on the wagon for all uses and work equally well whether with empty or loaded wagon. There is no use for a spring seat—they make a comfortable spring wagon out of a farm wagon—and save largely in wear and tear. We want Agents every where. Send for description and prices, and mention this paper.

SEMPLE & BIRGE MFG. CO., St. Louis, Mo.

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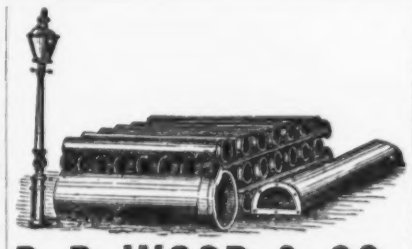
Manufacturer of Copper and Iron

SASH CHAINS,

With Patent Attachments.

Warranted for years. Chains of any size made to order, and trade supplied with liberal discount.



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FOR WATER AND GAS.

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400 CHESTNUT STREET.

PAT. "SCREW WINDOW BALANCES."

Retail Price, $1 per window (four balances).

Liberal Discount to the Trade.

Retain Medium and Light Window Sash at any point of opening, with large surplus holding power in reserve, available if required by drawing the adjusting screws. An acquaintance with the genuine merits of these goods, and their simple requirements in use will insure to them the favor of the user and applier.

A Mechanism always wanted, and as easily applied to windows as the common sash pulley, rendering the use of boxed frames, cords, pulleys, and the perplexing task of hanging sash unnecessary.

Sashes are locked with a meeting rail lock, as with weights.

Sample set, 4 Balances, sent postage free upon receipt of $1.

For sale by the Hardware trade. Address

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Manufacturer of Screw Balances,
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For sale by BUTLER & HUNTING, 53 Dey street, New York.

Watchman's Improved Time Detector, with Safety Lock Attachment.

Patented 1875-6-7.

Beware of infringements. This instrument is supplied with 12 keys for 12 different stations. Invaluable for all concerns employing night watchmen. Send for circulars to

E. IMHAUSER,
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HARDWARE, METAL, IRON RUBBER, SHOE, PAPER AND PAPER-HANGINGS, LUMBER, COAL AND RAILROAD PAPER WANTED.

ADVANCES MADE ON BUSINESSS PAPER AND OTHER SECURITIES.

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Factories at Pike Station, N. H., and Evansville and Westmore, Vt.

Genuine Old Reliable, Indian Pond (Red End)

Premium, Union,
White Mountain,
Letolle, Hacker,
Diamond Grit,
The New Boss,
Lamoille, Rugg,
Willoughby Lake,
Green Mountain,
Black Diamond,
Mowing Machine,
German Pattern,
Chocolate, Ax Bitts,

Stones made, labeled and branded in any style desired. PRICE AND QUALITY GUARANTEED. All the above brands are of clear, keen grit and *will not glaze.*

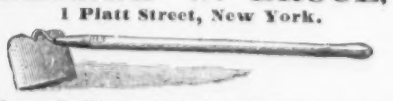
LAMONT PATENT

COMBINATION RAZOR STROP,

Manufactured by **COPELAND, HALL & Co.**
(Successors to H. O. Hall & Co.),
Rochester, N. Y.

GEORGE W. BRUCE,

1 Platt Street, New York.



Maynard's Planters', Yankee, Hilling and Bog Hoes, also Brades', Elwell's and others.
An unrivalled assortment.

Coal.

A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,

303 Walnut St.,

PHILADELPHIA,

No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.

A. Pardee & Co. { HAZLETON, CRANBURY, SUGAR LOAF

Pardee, Bro. & Co. LATTIMER

Calvin Pardee & Co. HOLLYWOOD.

Pardee, Sons & Co. MT. PLEASANT.

THE HOBOKEN COAL CO.,

Dealers in

SCRANTON, LEHIGH and other **COALS**

Retail Yard on D. L. & W. Railroad, cor. Grove and 10th sts., Jersey City. Coal delivered direct from shutes to carts and wagons. Families and manufactories supplied with the best qualities of Coal at the lowest rates.

OFFICES: At yard cor. Grove and 10th sts.; cor. Bay st. and Newark av., Jersey City; Room 35, 111 Broadway, N. Y. General Office, Bank Building, cor. Newark and Hudson sts., Hoboken. P. O. Box 247, Hoboken.

New York Wholesale Prices, May 12, 1880.

HARDWARE.

Anvils.
Eagle Anvils American ... ₩ ℔ 10c dis 20 %
W[illegible]'s ... 10¼c @ 11c
Armitage's Mouse Hole ... 9½ @ 9¾c
[illegible]enton ... 10½c

[illegible] and Bits.
Conn. Valley Mfg. Co.
Douglass Mf . Co.
Humphreysville Mfg. Co
[I]ves
Beecher (French, Swift & Co)
Griswold
Nobles Mfg. Co.
Kasson's Patent
} dis 40 % from list of Jan 7, 1880.
Cook's, Douglass Mfg. Co. ... dis 40&10 %
Snell Mfg. Co.'s C. S. Augers ... dis 40 %
" B. Machine ... dis 40 %
" C. S. Bits ... dis 40 %
" " Jennings' Bits ... dis 35 %
Patent Solid Head ... dis 30 %
Russell Jennings' Auger Dowel, Machine-Dowel and Hand-Rail Bits ... dis 10&10&10 %
Russell Jennings' Augers ... dis 16⅔&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers dis 25&10&10&10 %
Imitation Jenning's Bits ... dis 40@45 %
Ives' "Jennings" Bits ... dis 33⅓&10 %
Lewis' Single Twist Bits ... dis 40 %
Andrews Bits ... dis 50 %
Expansive Bits, Clark's, small, $18; l'ge, $26 ... dis 25 %
" " Ives' ... $20 @ $30—dis 33⅓ %
" " Blake's ... $20—dis 40 %
" " Parmelee's ... $20 and $30 .dis 33⅓ %
Hollow Augers Ives' / French Swift & Co. } dis 15 %
" " Douglas ... dis 15 %
" " Bonney's Adjust., ₩ doz $48—dis 25&10 %
" " Stearns' Adjust., ₩ doz $48—dis 20&10 %
" " Ives' Expansive ... each $4.50—dis 30 %
" " Univ'sal Expansive, each $4.50—dis 20 %
Gimlet Bits ... $7.50 ₩ gross, dis 45 %
" Diamond ... ₩ doz $1.10 dis 20&10 %
" "Bee" ... dis 45&10 %
Double Cut Gimlet Bits Shepardson's ... dis 40 %
" " Ct. Valley Mfg. Co ... dis 30&10 %
" " Hartwell's ... dis 60&10 %
" " Douglass' ... dis 40 %
" " Ives' ... dis 50 %
Morse's Bit Stock Drill ... dis 25 %
L'Hommedieu's Ship Augers ... dis 15 %
Watrous Ship Augers ... dis 15 %

Awl Hafts.
Sewing Brass Ferrule ... $3.50 ₩ gross—dis 40&10 %
Peg " ... 3.50 " dis 40&10 %
Patent Sewing, Short ... $1.00 ₩ doz—dis 40&10 %
" " Long ... $1.40 ₩ doz—dis 10 %
" Peg Plain Top ... $10.00 ₩ gross—dis 40&10 %
" " Leather Top ... 12.00 " dis 40&10 %

Awls, Brad Sets, &c.
Awls Sewing, Common ... ₩ gross $1.70—dis 25&10 %
" Shouldered Peg ... ₩ gross 2.45—dis 25&10 %
Patent Peg ... ₩ gross .63—dis 25&10 %
" Shouldered Brad ... ₩ gross $2.70—dis 25&10 %
" Handled Brad ... $7.00 ₩ gross—dis 20&10 %
" Handled Scratch ... $7.00 ₩ gross—dis 20&10 %
" Socket Scratch ... $1.00@$1.25 ₩ doz—net
[Br]ad Sets, Aiken's ... ₩ doz $12.00—dis 45&10 %
" No. 42, $10.50; No. 43, $12.50 ... dis 60&10 %
" Stanley's Excelsior, No. 1, $9.60 ... dis 20&10 %
" " No. 2, 4.80 ... dis 20&10%
" " No. 3, 7.80 ... dis 20&10%

Axes.
Single Bit, 4½ to 5½ and under ... ₩ doz $11.00 net
" 4½ to 6 and over ... ₩ doz $11.50 net
" Beveled ... 50 c ₩ doz advance
Double Bit, 4½ to 5½ and under ... ₩ doz $22.00 net
" 4½ to 6 and over ... ₩ doz $23.00 net
" Beveled ... $1.00 ₩ doz advance

Axle Grease.—Frazer's ... ₩ ℔ 6c

Axles.
C. H. & Co. ... 6c ₩ ℔ net

Bag Holders.
Sprengle's Patent, per doz. $18 ... dis 40 %

Balances.
All Spring Balances ... dis 15&10 %

Bells.
[H]and, Light Brass ... dis 50&10 %
Extra Heavy ... dis 40 %
White Metal ... dis 50 %
" Silver Chime ... dis 10&10 %
" Globe (Cone's Patent) ... dis 15&10 %
Gong, Abbe's ... dis 10&10 %
" Yankee ... dis 20&10 %
" Barton's ... dis 20&10 %
Crank Taylor's ... dis 25&10 %
" Brook's ... dis 50&10&2 %
" Cone's ... dis 10 %
Connel's ... dis 35 %
Lever, Sargent's, new list Dec., '78 ... dis 60&10 %
" Taylor's Bronze or Plated Lever ... net
" " Japanned Lever ... dis 25&10 %
" R. & E. M. Co.'s ... dis 50&10&2 %
Pull, Brook's ... dis 50&10&2 %
" Western ... dis 25&10 %
Call ... dis 25 %
Cow, Common Wrought ... dis 20&10 %
" Western ... dis 20&10 %
" Sargent's new list ... dis 30&10 %
" Kentucky "Star" ... dis 20&10 %
" " Sargent's new list ... dis 30&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog
$12.00 10.00 9.00 8.00 6.00 5.00 3.50 2.50 5.00 } dis 50 %
" Yaw's Genuine ... dis
" Texas ... dis 20&10
" Wilson's (Moore's) ... dis

Bellows.
Blacksmiths', Common ... dis 45 %
" Extra and Pittsburgh Pattern ... dis 20 %
Moulders ... dis 10 %
Hand Bellows ... List of Dec. 1, 1879, net

Belting, Rubber.
N. Y. Belting and Packing Co. ... new list net

Bit Holders.
Extension, Barber's ... ₩ doz $15.00—dis 40&5 %
" Ives' ... ₩ doz $15.00—dis 40 %
Diagonal ... ₩ doz $24.00—dis 40 %
Angular ... ₩ doz $24.00—dis 40 %

Blind Adjusters.—Domestic ... ₩ doz $3.00, dis 5 %

Blind Fasteners.—Mackrell's ... dis 30 %
Van Sand's ... No. 2000, per gross, $10.00 ... dis 10 %
" old pattern ... ₩ gross, $9.00 net
Washburn's Patent ... ₩ gross $10.50 net
Merriman's ... new list net
Mackrell's ... ₩ doz. pairs, $0.65, dis. 10 %

Blind Staples.
[B]arbed, ½ in. and larger ... ₩ ℔ 13½c net
" ⅜ in. ... ₩ ℔ 18c net

Blocks.—Burr & Co. ... dis 25&10%
Differential Pulley Blocks ... dis 20 %
Penfield Block Works, Rope and Iron Strap'd ... dis 40 %
Wrot. Iron Com. bushed ... dis 25 %
all steel roll'r ... dis 10 %
Sheaves ... dis 35 %
Stanley R. & L. Co., Rope and Iron Strap'd dis 33⅓&10 %

Bolts
Cast Iron Barrel, Shutter, &c. ... dis 40&10 %
Cast Iron Chain (Sargent's list) ... dis 60&10 %
Bush's Lever and Chain Bolts ... dis 40 %
Wrought Barrel ... dis 40&10 %
" Square ... dis 40&10 %
" Shutter, all Iron, Stanley's list ... dis 45 %
" " Brass Knob, " " ... dis 20&10 %
" " Sargent's list ... dis 40&10 %
" Sunk Flush, Sargent's ... dis 60&10 %
" " Stanley's ... dis 30 %
" B.K.Flush, Com'n, Stanley's ... dis 45 %
" " Ex. Heavy ... dis 40 %
" "Plated Knob & Slide Flush" ... dis 40&10 %
Carriage and Tire, Common ... dis 60&5 %
" " Philadelphia, new list ... dis 50 %
" " Philada. Pattern ... dis 50@50&10 %
" " Shelton's ... (old list) dis 55 %
R. B. & W. Carriage (old list) ... dis 55 %
Tire, Am. Screw Co.'s Phila, new list, Nov 1, '79, dis 60 %
" Bay State ... dis 80 %
" R. B. & W., new list ... dis 60 %
Stove—American Screw Co.'s ... dis 37½ %
" R. B. & W ... dis 37½ %
Plow ... dis 40 %
" R. B. & W ... dis 40 %
Machine, List of July 15, '79 ... dis 45&50 %
Bolt Ends " ... dis 45&50 %

Borax ... 11¾c@12¼c ₩ ℔ net

Boring Machines. Upright. Angular.
First quality, no Augers ... $5.50 $6.75 dis 33⅓ %
Phillips' with Augers ... 10.00 dis 40 %

Braces.—Barber's Patent ... dis 40&5 %
Q. S. Backus ... dis 60 %
Wilson Mfg. Co. ... dis 10 %
Spofford's Patent ... dis 50&5 %
Noble's Patent ... dis 40&5 %
Ives' Patent Braces ... dis 50&10 %
Common Ball (American) ... dis 40&10 %

Brackets.—Shelf (Sargent's) ... dis 40&10 %
Bright Wire Goods list of Dec. 15, 1879, dis 50&10 %
Bull Rings.—Union Nut Co. ... dis 50&20 %
Sargent's ... dis 60&10 %
Hotchkiss' ... low list dis 35%
Humason Beckley & Co.'s (low list) ... dis 0 %

Butts.
Wrought Brass ... dis 30 %
Cast Brass, Tiebout's ... dis 30 %
" Corbin's ... dis 40&10 %
Fast Joint, Narrow ... dis [illegible]&10 %
" Broad ... dis 20&10 %
Loose Joint ... dis 25&10 %
" Japanned ... dis 25&10 %
" with Acorns ... dis 30&10 %
Parliament Butts ... dis 25&10 %
Mayer Hinges ... dis 25&10 %
Loose Pin no Acorn ... dis 25&10 %
Acorns ... dis 25&10 %
" Japanned ... dis 30&10 %
Plated Tips ... dis 30&10 %
WROUGHT IRON.
Fast Joint Narrow ... dis 25&10 %
Lt. Narrow ... dis 25&10 %
Broad ... dis 25&10 %
Loose Joint, Broad ... dis 25&10 %
Table Butts, Back Flaps, &c. ... dis 25&10 %
Inside Blind, Regular ... dis 25&10 %
" Light ... dis 30&10 %
Loose Pin, Wrt ... dis 35&10 %
Spring Hinges:
American Spiral Spring Butt Co., Jap'd ... dis 25 %
" " " " Fancy ... dis 20 %
Gem Spiral Spring Butts, Japanned ... dis 25 %
" " " " Ornamental ... dis 20 %
Geer's Single and Double Acting ... dis 25 %
Sabin Mfg. Co.'s Double Acting ... dis 35 %
Union Spiral Spring, Japanned ... dis 25 %
" " Ornamental ... dis 20 %
Union Spring Hinge Co.'s ... dis 25 %
American Spring Hinge Co.'s ... dis 25 %
Union Mfg. Co. ... dis 25 %
Bommer's ... dis 25 %
Blind Butts, Parker ... dis 50&10 %
Palmer ... dis 30&10 %
Seymour ... dis 50&10 %
" Shepard's "Double Locking" Nos. 1 & 2 ... dis 50 %
" Shepard's "Noiseless," Nos. 50 & 60 ... dis 50 %
" Lull & Porter ... dis 55&10 %
" Nicholson ... dis 45&10 %
" Huffer ... dis 35&10 %
" Clark's, Nos. 1, 3, 5, 40 and 45 ... dis 50&10 %
" Sargent's No. 12 ... dis 50&10 %

Bow Pins.
Hotchkiss' ... low list net
Humason, Beckley & Co.'s (low list) ... dis 50 %
Sargent & Co.'s ... $19.70 and $21.10, dis 50&10 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co. ... dis 20 %
Bradley's ... dis 25 %
Beatty's ... dis 25&5 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50

Can Openers.
Messenger's Comet ... ₩ doz $3.00, dis 25 %
American ... ₩ doz $2.00, dis 70 %
Duplex ... ₩ doz 25c, dis 15@20 %
Lyman's ... ₩ doz $3.75, dis 20 %
No 4, French ... ₩ doz $2.25, dis 50 %
No. 5, Iron Handle ... ₩ gross $7.50 net
Eureka ... ₩ doz $2.50, dis 10 %
Sardine Scissors ... ₩ doz $7.00, dis 55 %
Star ... ₩ doz $5.00, dis 10 %
Sprague ... dis 50 %

Caps—Percussion, ₩ 1000.
U. M. C., F. C. trimmed ... 50c } dis
" F. L. ground ... 70c } 10 %
G. D. & S. B. ... 36c, dis 7½ %
Double Waterproof, in 1-10's ... $1.40 } dis
Colt's Pistol, " ... 70c } 10&5 %
F. L. ... 50c } dis 10&
E. B. 1-10, Trimmed ... 65c } 5 %
E. B. 1-10 Ground Edge ... 70c
Musket, in 1-10's ... 60c net

Cartridges.—Metallic ... dis 50 %
Cards.—Horse and Curry ... dis 10 %
Cotton ... dis 10 %
Wool ... dis 10 %
Car Pusher.—"Giant" ... $6.25 each, dis 20 %

Carpet Stretchers.
Cast Steel, Polished ... ₩ doz $5.00, dis 30 %
" Iron Steel Points ... ₩ doz $2.00, dis 30 %

Casters.
Bed ... dis 20&10 %
Plate and Shallow Socket ... dis 20&10 %
Deep Socket ... dis 20&10 %

Cattle Leaders.
Humason, Beckley & Co.'s (low list) ... dis 50&10 %
Sargent's ... dis 50&10 %

Chain.
Trace, 6½-1-2 ... ₩ pair 79c
" 6½-10-3 ... ₩ pair 70c } dis
" 7-10-2 ... ₩ pair 86c
German Halter Chain, New list Oct. 22, '79 ... dis 20 %
" Coil, New list Oct. 22, '79 ... dis 20 %
Covert Halter, Hitching and Breast ... dis 35 %
Oneida Halter Chain ... dis 30 %
Galvanized Pump Chain ... ₩ ℔ 10c net
Jack Chain, Iron ... dis 50 %
" Brass ... dis 40 %

Chalk.
White ... ₩ gross 60c net
Red ... ₩ gross 80c net
Blue ... ₩ gross 100c net
White Crayons ... ₩ gross 150 net

Chisels.
Socket Framing, Crossman ... dis 55&10 %
" Buck Bros ... new list, dis 22½ %
" Merrill ... dis 60 %
" Witherby Tool Co ... dis 60 %
" Douglass' ... dis 60 %
" Firmers, Crossman ... dis 55&10 %
" Buck Bros ... new list, dis 22½%
" Merrill ... dis 60 %
" Witherby Tool Co ... dis 60 %
" Douglass' ... dis 60 %
" Corner ... dis 60 %
Tanged Firmers extra ... dis 33⅓@40 %
" " Butcher's ... $5.00 @ $5.25 to £
" " Spear & Jackson's ... 5.00 to £
" " Buck Bros (Shank) ... 5.25 0 £

Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron ... dis 25 %
" Adjustable, Gray's ... dis 20 %
" " Lambert's ... dis 20 %
" " Snow's ... dis 40&5 %
" " Hammer's ... dis 15 %
" " Stearns' ... dis 15&10 %
" Cabinet, Sargent's ... dis 55&10 %
" Carriage Makers', Sargent's ... dis 55&10 %
" Cord and Tape (T. & S. Mfg. Co.) ... dis 30 %

Clips, Axle.
Norway or Best ... dis 40&5%
Superior ... dis 40&5 %

Coal Hods.
Griffiths ... dis 20 %

Cockeyes ... 1¼ in., 28c.; 1½ inch, 33c.; 1¾ in., 47c, net

Cocks, Brass.
Racking ... new list, Jan. 1, '80
Globe ... " "
Plain Bibbs ... " " } dis 25 & 10 %
Ale and Beer ... " "

Coffee Mills.
Board and Box ... new list, Jan., 1880, dis 35 %
Increase Wilson's ... net
Selsor's Pat ... $9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) ... dis 15 %
French Steel ... dis 20 %
The Swift (Lane Bros.) ... dis 0 %

Combined Dinner Pail and Lantern.
Per doz $15.00 ... dis 30 %

Compasses, Dividers, &c.
Compasses ... dis 45 %
Callipers ... dis 45 %
Dividers ... dis 45 %
Bemis & Call Co.'s Dividers ... dis 60&5 %
" " Compasses & Callipers ... dis 50&5 %
" " Wing & Inside or Outside, dis 50&5 %
" " Double ... dis 60 %
" " Call's Pat. Inside ... dis 30 %
Cook's ... dis 25 %
Excelsior ... dis 50 %
Miller's Patent ... dis 25 %

Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Corkscrews.—Humason & B. ... dis 33⅓ %
Corn Knives and Cutters.—Bradley's ... dis 10 %
Wadsworth's ... dis 33⅓ %

Crow Bars.
Cast Steel ... ₩ ℔ 8¼c
Iron, Steel Points ... ₩ ℔ 6¼c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80 2.00, 2.40 ... dis 10 %
Curling Tongs ... ₩ doz $3.65, dis 10 %
Pinching Irons ... ₩ doz 7.50, dis 20 %

Curry Combs.
Fitch's (List of No. 240, $1) ... dis 40 %
Hotchkiss' Novelty ... dis 20 %
Lawrence ... dis 30&10 %
Lawrence, with detachable Mane Comb ... dis 25&10 %
Rubber ... ₩ doz $10.00, dis 15 %

Curtain Pins.—Silvered Glass ... net
White Enamel ... net

Cutlery.
Meriden Cutlery Co. (Table) ... net
Am. Miller Bro.'s Cutlery Co. ... dis 25 %
Humason & Beckley, Pocket ... dis 30 %
F. W. Rogers & Son, A. A. ... dis 40&5&5 %
Naugatuck Cutlery Co. ... list net
Aaron Burkinshaw's Pocket ... dis 25 %

Dog Collars.
Embossed Gilt ... dis 20 %
Leather ... dis 30 %
Brass ... dis 25 %

Door Springs.
Torrey's Rod ... ₩ doz $2.84 net
Gray's " ... ₩ doz $2.25, net
Bee Rod ... ₩ doz $2.25, net
Gem (Coil)—
No. 1, Large, Japanned ... ₩ doz $3.50 }
No. 2, Medium, ... ₩ doz 2.50 } list net
No. 3, Small ... ₩ doz 2.00 }
Challenge (Coil)— Nos. 9 7 6
Japanned ... ₩ doz $2.00 2.50 3.50 }
Coppered ... ₩ doz 4.00 4.50 5.00 } dis 10 %
Galvanized ... ₩ doz 3.50 4.00 4.50 }
Nickeled ... ₩ doz 5.50 6.00 7.00 }
Star (Coil)—For Cop'd, Nickel-Plated, &c. see list.
No. 4, ("Shoo Fly") Screen door size ₩ doz $1.80 }
No. 5, Screen Door Size ... ₩ doz $2.00 } dis 20 %
No. 6, Medium ... ₩ doz 2.50 }
No. 7, Large ... ₩ doz 3.50 }
Sabin's Lever .No. 1, $1; 2, $1.50; 3, $2; 4, $2.50; dis 30 %
Sabin's Boss ... No. 1, $5.40; 2, $4.20; 3, $3.00, dis 50 %
Sabin's Crown ... ₩ doz $2.75, dis 50 %
Philadelphia ... 5 in., $5.00; 8 in., $7.00, dis 35 %
Barker's Concealed ... dis 20 %
Cowell's ... No. 1, $18.00; No. 2, $15.00 ₩ doz, dis 50 %
Rubber, complete ... ₩ doz $1.80, net

Drawing Knives.
Crossman's No. 1 ... dis 55&10 %
Merrill ... dis 60 %
Nobles Mfg. Co ... dis 15 %
Bradley's ... dis 35 %
Adjustable Handle ... dis 20 %
Witherby Tool Co. ... dis 60 %
Douglass ... dis 60 %

Drills and Drill Stocks.
Blacksmiths' ... each $3 50 net
Blacksmiths' Self Feeding ... each $7.50, dis 10 %
Breast, P. S & W ... dis 20 %
" Hotchkiss ... dis 20 %
Breast, Wilson's ... dis 20 %
" Miller's Falls ... each $3.00, dis 25 %
Bartholomew's ... each, $2.50 dis 25&10 %
Ratchet, Merrill's ... dis 20 %
" Ingersoll's ... dis 25 %
" Whitney's ... dis 15 %
" Weston's ... dis 20 %
Moore's Triple Action ... dis 20 @ 25 %
Whitney's Hand Drill ... dis 50 %
Wilson's Drill Stocks ... dis 10 %
Automatic Boring Tools ... each $2.25, dis 20 %
Drill Chucks.—Morse's Beach Patent ... dis 30 %
" Adjust. each $10.00, dis 30 %
Danbury ... $8.00, dis 30 %

Egg Beaters.
Dover ... ₩ doz. $2.50 net
National ... ₩ do 33⅓ %
Family ... per gross $33; per doz., $3.00 net

Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in. (Duc's Improved) ₩ 100 $15.00 @ $54.00, net
Mill E. Buckets, heavy, 5 to 10 inches (Duc's Improved) ₩ doz $5.60 @ $10.20 net
Storehouse, (Duc's Patent) 12 to 17, $12.00 @ $20.00 ... net

Emery and Emery Paper.
Genuine Chester—Regular Nos ... ₩ ℔
" " Flour and FF ... ₩ ℔
" " in 10-lb. cans ... 2c extra
Washington Mills—Regular Nos ... ₩ ℔ 8c
" Flour ... ₩ ℔ 5c
Wellington Mills, Grain ... ₩ ℔ 10c net
" " Flour ... ₩ ℔ 8c net
Hampden Emery Grain ... 5c net
Flour ... 3c net
B. & A. Emery Paper ... dis 20@25 %

Enameled and Tinned Ware.
Kettles ... dis 50 %
Sauce Pans ... dis 35&5 %
Tinned Sauce Pans ... dis 35&5 %

Escutcheon Pins.
Iron ... dis 20 %
Brass ... dis 35 %

Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60&10 %
Wood ... dis 25 %

Faucets.
Fenn's ... dis 40 %
Fenn's Cork Stops ... dis 33⅓ %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 20&10 %
Wood and Metallic ... dis 40 %
West's Patent Key ... dis 45 %
Metallic Key, Leather Lined ... dis 40 %
Cork Lined ... dis 70 %
Enterprise (Self Measuring) ... ₩ doz, $36.00, dis 15 %

Felloe Plates ... ₩ ℔ 10c, dis 5 %

Files.
Auburn ... $5.00 to £, dis 35 %
Arcade ... $5.00 to £, dis 20 %
E. M. Boynton's ... new list, dis 25 %
G. & H. Barnett, "Black Diamond" ... dis
Nicholson ... (Nicholson List) dis 20 %
Madden & Cockayne File Co ... dis 20 %
Heller & Bros (new list) ... dis 10 %
Hiscox File Mfg. Co., new list ... dis 20 %
J. & Riley Carr ... 4.50 to £
Johnson & Bro ... dis 20 %
Butcher's ... 4.50 to £
Walter Spencer & Co.'s "Diamond" ... 4.50 to £
Fisher's ... 4.75 to £
Moss & Gamble ... 4.50 to $
H. Disston & Sons (new list) ... dis
Western (new list) ... dis 20%
Limet & Co. (French) ... $4.25 to $

Fluting Machines.
Knox, 4-inch Rolls ... $3.25 each }
" 6 " " ... 4.00 " } dis 10 %
" 8 " " ... 6.50 " }
Peerless, 4-inch Rolls ... 4.00 each net
" 5 " " ... 4.75 each net
Eagle, 3½-inch Roll ... $2.15, dis 10 %
" 5½ " " ... $2.85, dis 10 %
Eureka, No. 1, 7-inch Roll ... 5.00 each, dis 10
" No. 2 5-inch Roll ... 4.00 each, dis 10 %
Crown, 4½-in. $3.50; 6-in., $4.00; 8-in. , $6.50 each dis 10 %
Star ... 4½ in., $4.00; 6 in., $5.00 each dis 10 %
Crown Jewel ... 6 in., $3.40 each, dis 10 %
American, 5 in., $3; 6 in., $3.40; 7 in., $4.50 each, dis 10 %
Domestic Fluter ... 1.50 each net
Geneva Hand Fluter, No. 1 ... ₩ doz $15, dis 20 %
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00 ₩ doz ... dis 10 %
Shepard Hand Fluter ... No. 75 ₩ doz $15, dis 10 %
" " " No. 90, $9.00; No. 110, $7.25;
" " " No. 100, $6.00 ₩ doz ... net
Clark's Hand Fluter ... ₩ doz $15.00, dis 20 %
Combined Fluter and Sad Iron ... ₩ doz 15.00, dis 30 %
Buffalo ... ₩ doz 10.00, dis 10 %

Fluting Scissors ... dis 45 %

Forks.
Hay, Manure and Spading ... dis 25 %
Plated "A 1, Rogers & Bro ... dis 40&5 %
" Reed & Barton ... dis 40&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co ... dis 15 %

Fry Pans.
Burnished, list as follows ... dis 4 %
No ... 0 1 2 3 4 5 6 7 8
₩ doz ... $3.00 $3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00

Gauges.
Marking, Stanley's ... dis 45&10 %
" Chapin's ... dis 50&10 %
Wire ... dis 10 %
" Smith's Patent ... ₩ doz $18.00, dis 40 %

Gimlets.
Nail and Spike ... dis 40@45 %
"Bee" Gimlets ... ₩ gross $12.00 dis 60 %
"Eureka Gimlets ... dis 50 %
"Diamond Gimlets ... dis 40 %
Double Cut Shepardson's ... dis 40 %
" " Hartwell's ... dis 50 %
" " Ives' ... dis 50 %
" " Douglass' ... dis 40%

Glue Pots.
Tinned and Enameled ... dis 30 %
Family, Howe's "Eureka" ... dis 40 %
" L. F. & C.'s "Handy ... dis 25 %

Grindstone Fixtures.
Sargent's Patent ... dis 40&10 %
Reading Hardware Co ... dis 10%
" " "Keystone" ... dis 10&10 %

Gun Wads.
U. M. C. B. E. 11 up ... $2.00 }
" " 9 & 10 ... 2.30 }
" " 7 & 8 ... 2.00 } dis 5&5 %
" P. E. 11 up ... 3.10 }
" " 9 & 11 ... 4.00 }
" " 7 & 8 ... 4.90 }

Halters.
Covert's Pat. Rope ... dis 50 %
Horse and Cattle Ties, Covert's ... dis 50 %

Hammers.
Maydole's ... dis 15 %
Cheney's ... dis 25 %
H. Hammonds (new list Jan. 20, '80) ... dis 20 %
Verree ... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75, dis 20&10 %
Warner & Noble's ... dis 10 %
Kip's (old list) ... dis 20 %
Yerkes & Plumb ... dis 15 %

Hand Cuffs and Leg Irons.
Providence Tool Co.'s Hand Cuffs, $15.00 ₩ doz } dis 10 %
" " Leg Irons, $25 ₩ doz }
Tower's ... dis 25 %

Handles.—Door or Thumb Latches—
Nos. 0 1 2 3 4
Per doz ... $0.80 1.00 1.18 1.35 1.60 ... dis 50@55 %
Roggin's Latches ... per doz 45c@50c net
Bronzed Iron Drop Latches ... ₩ doz 60 @ 80c net
Jap'd Store Door Handles—Nuts, $1.80; Plate $1.20 no Plate, 96c ... net
Barn Door ... per doz $5.00, dis 45&10 %
Wrought Chest ... dis 50&10 %
Surface Chest, Sargent's list ... dis 50&10 %
Flush Chest ... dis 50&10 %
Lifting ... dis 45&10 %
Saw and Plane ... dis 40&10 %
Boynton's Pat. Loop Saw Handles ... dis 25 %
" " Centennial Saw Handles ... dis 25 %
Hammer and Hatchet ... dis 20 %
Brad Awl ... ₩ gross $2.00, dis 20&10 %
Hickory Firmer Chisel, assorted, ₩ gross $4.50
" " " large, " 5.00
Apple " " assorted, " 5.00
" " " large, " 6.00
Socket " " assorted, " 3.00 } dis 20&10 %
" Framing " assorted, " 5.00
File, assorted, ₩ gross ... 2.75
Auger, assorted, ₩ gross ... 6.00
" large ... 7.00
Patent Auger, Ives' ... dis 25
" Douglass' ... ₩ set $1.25, net
" Swan's ... ₩ set $1, net

Hangers.
Barn Door ... dis 40&10 %
Novelty ... dis 40 %
Challenge ... dis 50 %
Climax (Anti-Friction) ... dis 40 %
Sterling Improved (Anti-Friction) ... dis 55&10 %
Cheritree ... dis 40 %
Kidder's ... dis 40 %

Harness Snaps.
Henshaw's ... List of 1⅛ changed to 14.00, dis 55&2 %
Judd's ... " " " 14.00, dis 55&2 %
Fitch's (Bristol) " " " 14.00, dis 40 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 50 %
Sargent's ... dis 50&10 %
"German ... dis 60&5 %
Covert ... dis 40 %

Hatchets.
Isaiah Blood ... dis 15 %
Shingling, Nos. 1 2 3 ... ₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ₩ doz 7.50 8.00 8.50
Hunt's ... dis 15 %
Shingling, Nos. 1 2 3 ... ₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ₩ doz 7.50 8.25 9.00
Hurd's ... dis 25 %
Shingling, Nos. 1 2 3 ... ₩ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ₩ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ₩ doz 8.00 8.50 9.00
Yerkes & Plumb ... dis 15 %
Shingling, Nos. 1 2 3 ... ₩ doz $7.50 $8.00 $8.50
Claw, Nos. 1 2 3 ... ₩ doz 8.25 8.75 9.25
Lathing, Nos. 1 2 3 ... ₩ doz 7.50 8.00 8.50
Simmon's ... dis 20 %
Shingling, Nos. 0 1 2 3 ... ₩ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ₩ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ₩ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 ... ₩ doz 9.00 10.00 12.00 14.00
" Nos. 5 6 7 8 ... ₩ doz 16.00 18.00 20.00 22.00
Collins ... dis 10 %
Shingling, Nos. 1 2 3 ... ₩ doz $6.00 $6.50 $7.00
Claw, Nos. 1 2 3 ... ₩ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3 ... ₩ doz 6.00 6.50 7.00

Hay Knives.
"Lightning" ... ₩ doz $20.00 net
Wadsworth's ... dis 33⅓

Hinges.
Gate, Western ... ₩ doz $10.00, dis 40&10 %
" N. E. ... ₩ doz $10.13, dis 40&10 %
" N. E. Reversible ... ₩ doz $6.50, dis 40&10 %
Gate, Clark's No. 1 ... ₩ doz $[illegible], dis 40 %
" N. Y. State ... ₩ doz $[illegible], dis 50&10 %
" Automatic ... ₩ doz $12.50 dis 40 %
" Common Sense ... dis 10 %
" Seymour's ... dis 40&10 %
" Shepard's ... Nos. 10, 20 & 25, dis 40 %
Rolled Blind Hinges ... dis 40&10 %
Rolled Plate ... dis 40&10 %
Rolled Raised ... dis 40&10 %
Wrought Strap and T, list Dec. 20, '77 ... dis 25&10 %
Plate Hinges { 8, 10 & 12 in. $7.50 ₩ 100 ℔ / "Providence" { over 12 in. $6.25 ₩ 100 ℔ } ... dis 10 %
Screw Hook and Strap { 6, 8, 10, 12 in., $8.00 ₩ 100 ℔ / 14 to 36 in., $6.75 ₩ 100 ℔ } dis 10 %
Heavy Welded Hook { 8 to 12 in., $8.00 ₩ 100 ℔ / 14 in. & up, 6.75 ₩ 100 ℔ } dis 10 %
Screw Hook and Eye ... { ⅝ & 1 in., 9c / ¾ in., 9c / ⅜ in., 10c / ½ in., 12c } net

Hoes.—Solid Shank, C. S. ... ₩ doz $8.00, dis 25
Socket ... ₩ doz 9.00, dis 25 %
Grub ... dis 15 %
Planters' ... dis 35 %
Scovill Pattern ... dis 33⅓ %
Scovill Pattern, Handled ... dis 25 %
Hick's Pat. Solid C. S. Planters' ... dis 20&10 @ 30 %
" " " Scovill Pattern dis 20&5 @ 35 %
Winsted & Lane, Planters ... dis 25 %
" " Scovill Pattern ... dis 20@25 %

Hooks.
Bird Cage, Sargent's list ... dis 50&10 %
Cotton ... dis 50 %
Cotton, Patented (N. Y. Mallet & Handle Wks), dis 30
Cotton (Humason & Beckley Mfg. Co.) ... dis 40 %
Belt, (new list Dec. 24, 1879,) ... dis 55&10
Bench—Hotchkiss' $5.00 ₩ doz ... net
" Weston's, No. 1, $10.00; No. 2, $9.00 ₩ doz dis 25
" McGill's, $3.00 ₩ doz ... dis 10
" Skinner's, $6.25 per doz ... dis 20
Clothes Line Sargent's list ... dis 40&10
" " Reading list ... dis 10&10
Ceiling .. } Sargent's list ... dis 40&10 %
Harness } Reading list ... dis 5&10 %
Coat and Hat, Sargent's list ... dis 40&10 %
" " Reading ... dis 15&10 %
" " T. & S. Mfg. Co's list ... dis 25 %
Picture Hooks, Brown's Pat. Solid Brass, $4 per gross ... dis 25 %
Tassel (T. & S. Mfg. Co.) ... dis 40 %
Wrought Staples and Hooks and Staples ... dis 50 %
" Staples, Stanley's list ... dis 50&10 %
Wire Screw Hooks and Eyes, new list ... dis 50&10 %
Grass and Bush ... dis 40@45 %
Whiffletree—Patent ... dis 45 %
Hooks and Eyes—Malleable Iron ... dis 50&10 %
" Brass ... dis 50&10 %

Horse Nails.
Nos. 5 6 7 8 9 10
Ausable ... ₩ ℔ 30c 27c 25c 24c 23c 22c } dis
" Finished, Polished or Blued ... " 31c 28c 26c 25c 24c 23c } 20 %
A. C. ... 60 50 40 30 27 25 23 22 21 21 20 20c } dis
Nos. ... 1 2 3 4 5 6 7 8 9 10 11 12 } 15 %
Nos. 5 6 7 8 9 10
H. P. Pointed and Finished ... 26 23 21 20 19 18 } 19 / 20 %
National, Pointed and Polished, Pat. Fin ... 28 25 23 22 21 20c %
Putnam Hammer, P't'd 29 26 24 23 22 21c %

Horse Shoes.—Burden ... ₩ keg $5.12½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy ... ₩ keg 5.12½
Mule Shoes ... ₩ keg 6.12½

Ice Awls, Chisels, &c.
American Ice Chisel ... ₩ doz. $3.50 net
National " ... ₩ doz $0.25 dis 20 %
Novelty Ice Breakers ... ₩ doz $6.25 dis 20 %
White's Sliding Head Picks ... ₩ doz $2.50 dis 40 %
Dunlap's Ring Picks ... ₩ doz $[illegible] dis 40&10 %
Wood Head Picks, Sargent's ₩ doz $1.85, dis 60&10&10 %
Iron ₩ doz 1.85, dis 60&10&10 %
Ice Mallets Pick in Head ... ₩ doz 1.75 net
" Pick in Handle ... ₩ doz 3.00 net
Ice Axes, Small, Cast or Malleable ... ₩ doz 1.20 net
Kitchen Ice Tongs ... ₩ doz 2.25 net
Combination Ice Tools ... ₩ doz $2.00 net

Kettles.
Brass, 7 to 13 inches inclusive ... ₩ ℔ 35c net
Brass, larger than 13 inches ... ₩ ℔ 38c net
Enameled ... dis 40 %

Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe ... dis 15 %
" Bread ... ₩ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives ... dis 20 %
Hay and Straw—Wadsworth's ... dis 33⅓ %
Table and Pocket ... See Cutlery

Knobs.
Carriage (Jap'd 80c. ₩ gross) ... dis 50 %
Base—Common ... dis 30&10%
Hemacite Door Knobs ... New list, dis 35&5 %
Door, Mineral ... }
" Por. Jap'd ... }
" " Plated ... } Same discounts as Door Locks.
" " Por. ... }
Furniture, Plain ... 75c gross inch, dis 10 %
" Wood Screws ... dis 20 %
Picture (T. & S. Mfg. Co.) ... dis 40 %
" Sargent's ... dis 45&10 %
Hemacite Picture ... dis 35 %
Shutter, Porcelain ... dis 50 %

Ladles.
Melting—Sargent's ... dis 40&10 %
" Reading ... dis 10&10 %
" Monroe's Patent ... ₩ doz $4.00, dis 25 %

Lanterns.
Tubular ... No. 0, $9.60; No. 1, $11.30 / With Guards 25c extra. } net
Hurricane No. 2 ... ₩ doz $5.75, net
Peerless ... No 5, ₩ doz $11.75, dis 10&10 %
Brady's Patent ... dis 10&10 %
Ætna ... dis 10&10 %
Yankee ... dis 10&10 %
De Beque ... dis 10&10 %
Police ... Small, $7.00; Med., $8.25; Large, $12.00, dis 10 %
Convex Reflector ... $2.75 ₩ doz, dis 10 %

Lemon Squeezers.
Porcelain Lined ... ₩ doz $6.00—dis 30 %
Wood ... ₩ doz 3.00—dis 30 %
Eureka, Tinned ... ₩ doz $8.00, dis 10 %
Dunlap's Improved ... ₩ doz $4.00 net
Sammis' ... No. 1, $7.00; No. 2, $12.00 ₩ doz., dis 45 %
Townsend's Patent ... $6.00 ₩ doz., dis 33⅓ %

Lines.—Linen Fish ... dis 25&10 %
Cotton Chalk ... dis 55 %
Slt. Lake Chalk ... Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50 ... dis 15&10 %
Mason's Linen ... dis 25&10 %
Wire Clothes, Galvanized ... each 20 @ 40c net

Locks and Latches.
Cabinet—Eagle ... }
" Gaylord ... } Old list restored, March 1880—dis 10&2 %
" Bridgeport ... }
" A. E. Deitz ... dis 30 %
Trunk ... dis 10 %
Langstroth & Crane's List Jan. 1 '77.
Round Key, No. 1 to 5 ... dis 40&10 %
" No. 5½ to 12 ... dis 40& 10 %
Flat Key ... dis 33⅓&10 %
A. E. Deitz, Flat Key ... dis 30 %
Yale Lock Co., Flat key ... dis 40 %
"Shepardson" or "U. S." ... dis 35 %
"Fetter" or "American" ... dis 33⅓ %
Plate ... dis 20&5&2 %
F. Many's "Extension Cylinder" ... $10.50 ₩ doz, net
DOOR LOCKS, &C
Branford ... }
Norwalk ... }
Norwich ... }
P. & F. Corbin ... } New list, Dec. 15, 1879.
Russell & Erwin ... } dis 30&2 %
Mallory, Wheeler & Co. }
Reading Hardware Co. }
Trenton Lock Co. ... }
Padlocks—Russell & Erwin ... }
" Mallory, Wheeler & Co. ... } ... dis 10&5 % and 2 % for cash
" Wm. Wilcox & Co. ... }
" Yale Lock Mfg. Co.'s "Standard" ... dis 40 %
" Romer's ... dis 30 %
" Conestoga ... dis 60 %
" J. H. McWilliams ... dis 10 %
" A. E. Dietz ... dis 35 %

Mallets.—Hickory ... dis 10&10 %
" Lignumvitæ ... dis 10 %

Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
₩ doz. $14.00 17.00 19.00 30.00—dis 25 %
Miles' Challenge ... Nos. 1 2 3
₩ doz. $22.00 30.00 40.00—dis 25 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each ... $3.00 4.00 5.00 11.00 13.00 36.00—dis 25 %
Woodruff's (P. S. & W.) ... Nos. 100 150
₩ doz $15.00 18.00 dis 25 %
Hales' ... Nos. 11 12 13
₩ doz. $36.65 44.40 56.60 ... dis 40&10 %
Draw Cut ... Nos 5 2 6 8 10
Each ... $50.00 75.00 80.00 225.00 400.00—dis 20 %
American ... dis 25 %
Nos ... 1 2 3 4 B 5
Each ... $5.00 7.00 10.00 25.00 50.00 60.00
Silver & Deming ... dis 25 %
Pennsylvania ... dis 40 %
Nos ... 1 2 3
₩ doz ... $24.00 28.00 36.00
Beef Shavers (Enterprise Mfg. Co.) ... dis [illegible] %

Mincing Knives.
Am., 1 blade, $12; 2 blades, $21; 3 blades, $30 per gross
Lathrop's ... dis 25 %
Smith's ... per doz $1.75, dis 10 %

Molasses Gates.
Stebbins Pattern ... dis 60&10 %
" Genuine ... dis 47½&10 %
" Tinned Ends ... dis 40&10 %
Chase's Hard Metal ... dis 60&10 %
Bush's ... dis 20 %
Lincoln's Pattern ... dis 50&10 %
Weed's ... dis 15 %

Nails ... See Trade Report

Nuts and Washers.
Square Nuts ... 5½@6c off list
Hexagon Nuts ... 5½@6c off list
Washers ... 5 @5½c off list

Nut Crackers
Table (Humason & Beckley Mfg. Co.) ... dis 33⅓ %
Blake's Pattern ... ₩ doz $2.60, dis 10 %
Turner & Seymour Mfg. Co ... dis 50 %

Oakum.
Best ... ₩ ℔ 10½c
U. S. Navy ... ₩ ℔ 9½c
Navy ... ₩ ℔ 8c

Oilers.—Zinc and Tin ... dis 45 %
Brass and Copper ... dis 40 %
Olmsted's ... dis 40 %
Broughton's ... dis 40 %
Malleable (Hammer's) ... ₩ doz $5.00, dis 10 %
Prior's Patent or "Paragon," Zinc ... dis 45 %
" Brass ... dis 40 %

Ox Balls ... dis 40&10%

Pencils.
Faber's Carpenters' ... High list, dis 40&10 %
" Round Gilt ... ₩ gross $5.25 net
Dixon's Lead ... ₩ gross 4.50 net
" Lumber ... ₩ gross 6.75 net

Packing, Steam.
N. Y. Belting and Packing Co. ... new list net

Picture Nails.
Brass Head, Sargent's List ... dis 35&10 %
" T. & S. Mfg. Co ... dis 40 %
Porcelain Head, Sargent's List ... dis 35&10 %
" " Judd's List ... dis 30 %
Porcelain Head, T. & S. Mfg. Co ... dis 30 %

Pinking Irons. ... ₩ doz 75c, net

Plaiting Machines.
Magic ... ₩ doz $10.00, net
Astor Plaiting Machine ... each $15.00, dis 20 %
Crown Plaiting Machines ... dis 25 %
6in., $6.00. 10in., $10.00 each

Planes and Plane Irons.
Bench, First Quality ... dis 25&10 %
" Second " ... dis 30&10 %
Moulding ... dis 25&10 %
Bailey's (Stanley R. & L. Co.) new list Jan. '79, dis 20&10 %
The Stanley (S. R. & L. Co.) " " dis 20&10 %
Bailey's "Victor" ... dis 20&10 %
Defiance Adjustable ... dis 20 & 10 %
Plane Irons, Butcher's ... $5.50 to £
" Buck Bros ... $5.00 to £
" Auburn Tool Co.'s ... dis 5&10 %
" Middletown Tool Co ... dis
" Ohio Tool Co ... dis 5&10 %
" Sandusky Tool Co ... dis 5&10 %

Pliers and Nippers.
Button's Patent ... dis 33⅓ %
Hall's Pat. Compound Lever Cutting Nippers No. 2; 5 in., $20; No. 4, 7 in., $30 ₩ doz ... dis 25 %
Humason & Beckley Mfg. Co. ... dis 33⅓ %
Gas Pliers ... dis 50 %
Eureka Pliers and Nippers ... dis 25 %
Russell's Parallel ... dis 25 %
P. S. & W. Cast Steel ... dis 30 %
" " End Cutting Nippers ... dis 25 %
" " Tinners' Cutting Nippers ... dis 15 %

Plumbs and Levels.
Disston's ... dis 65 %
Stanley R. & L. Co.'s Pat. Adjustable ... dis 60&10 %
" " Non-Adjustable ... dis 50&10 %
Chapin's Patent Adjustable ... dis 60&10 %
" Non-Adjustable ... dis 60&10 %
Standard Rule Co.'s New Adjustable ... dis 60&10 %
" " Non-Adjustable ... dis 60&10 %
Johnson's Patent Adjustable ... dis 60&10 %
Pocket Levels ... dis 60&10 %

Post Hole and Tree Augers.
Samson Post Hole Digger ... per doz $37.50, dis 20 %
Fletcher Post Hole Augers ... ₩ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz ... dis 15 %

Potato Parers, &c.
Bay State ... ₩ doz $13.00 dis 10 %
"Saratoga" Peeler and Slicer ... ₩ doz $9.00 net

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw per doz $19.00, dis 20 %
" Pruning Hook ... " 12.50, dis 20 %
E. S. Lee & Co.'s Pruner ... dis 30 %
Pruning Shears ... ₩ doz $5.50@$6.00

Pulleys.
Hot House and Tackle ... dis 50&10 %
Jap'd Screw ... dis 50&10 %
Brass Screw ... dis 45&10 %
Jap'd Side ... dis 50&10 %
" Clothes Line ... dis 50&10 %
Hay Fork Solid Eye, $4.50; Swivel, $5.00, dis 20&10&10 %
" " "Anti-Friction," ... $7.50 dis 20&10 %
" " "F" Common and Pat. Bushed ... dis 20 %
" " Tarbox Pat. Iron ... dis 20 %
Shade Rack ... dis 50 %

Punches.
Belt or Drive ... ₩ doz $2.00; 2.25; 2.50, dis 40 %
Bemis & Call Co.'s Cast Steel Drive ... dis 50&5 %
" " Springfield Socket ... dis 50&5 %
Spring ... ₩ doz $7.00, dis 45 %
" Leach's Patent ... dis 15 %
Bemis & Call Co.'s Spring and Check ... dis 40 %
Solid Tinners' ... ₩ doz $1.44, dis 25 %

Rail.
Sliding Door Wrought Brass.....₩ ℔ 44c dis 20 %
" " Iron, Painted .₩ foot 9c. dis 40&10 %
Barn Door ⅜, ⅝ and ¾ inch.....dis 55&10 %
" for N. E. Hangers.....dis 55&10 %

Rakes.
Cast Steel.....dis
8 10 12 14 16 teeth.
$6.00 5.75 6.50 7.25 8.00
Malleable.....dis
10 12 14 teeth.
$3.60 4.00 4.40

Razor Straps.
enuine Emerson.....dis 40 %
Badger's Emerson.....dis 40
Badger's (not Emerson).....dis 25 %
Evans'.....dis 40 %
Imitation Emerson.....₩ doz $2.75, dis 40&10 %
Hunt's.....dis 40&5 %
Chapman.....dis 15 & 20 %
Saunder's.....dis 10 %
Torrey's.....dis 20 %

Rivets.
Iron and Tinned } new list Oct. 1, 1879 } ..... dis 30 %
In bulk } ..... dis 10 %
Copper Rivets and Burs.....dis 25 %
Nos.. 7 8 9 10 11 12 13 14 15
₩ ℔..400 500 520 540 560 580 600 640 700
Tinned Iron Belt Rivets and Burs.....dis 10 %

Rivet Sets.....dis 25 %

Rods.
Stair.....New list, March 1, '79, dis 10 %
" American Patent.....dis 40 %

Rollers.
Barn Door, Sargent's list.....dis 55&10 %
Novelty.....dis 10 %
Acme (Anti-Friction).....dis 40 %

Rope. Manufacturers' Net List, Dec. 10, 1879
Manila.....½ inch and larger ₩ ℔ 14½c
" .....⅜ inch ₩ ℔ 15 c
" .....¼ and 5-16 inch ₩ ℔ 15½c
Tar'd Rope.....₩ ℔ 14 c
" " Lath Yarn.....₩ ℔ 14 c
" Hay Rope.....₩ ℔ 14½c
Sisal.....½ inch and larger ₩ ℔ 13 c
" .....⅜ inch ₩ ℔ 13½c
" .....¼ and 5-16 inch ₩ ℔ 14 c
" Hay Rope.....₩ ℔ 13 c

Rules.
Boxwood. Ivory
Chapin's.. } dis 55 & 10 % } dis 15 &10 %
Standard....
Stanley.....
Stephens.....

Sad Irons.
From 4 to 10 lbs.....₩ ℔ 4½c net
Self Heating.....₩ doz $6.50 net
" Tailors'.....₩ doz $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Enterprise Patent Cold Handle.....dis 20 %
Mrs. Pott's Pat. Cold Handle, "Crown".....dis 20 %
Combined Fluter and Sad Iron..per doz $15.00, dis 15 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½..$4.75 ₩ ream
" " 2, 2½ & 3.. 4.25 ₩ ream } dis
" " " Assorted 4.75 ₩ ream } 20&
" " Star..... 3.75 ₩ ream } 25 %
" " Emery..₩ ream $6.50 @ 11.50
New England, same list as B. & A. Flint.....dis 20&25 %
Gare's.....dis 20&5 %

Sash Cord.
Common.....₩ ℔ 14 @ 20c net
Patent.....₩ ℔ 19c net
Silver Lake Russia Flax.....₩ ℔ 65c. dis 10 %
" White Cotton.....₩ ℔ 60c. dis 10 %
" Drab Cotton.....₩ ℔ 65c. dis 10 %
Raw Hide.....dis 25 %
Steel Ribbon.....dis 10 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross.....dis 33⅓&
Ferguson's.....dis 33⅓ %
Walker's.....dis 10 %
Hammond's Window Springs.....dis 25 %
Northup Window Springs.....$9.00 per gross, dis 10 %
The Perfect, Clark & Smith, Plain Jap'd ₩ gro $10.00 net
" " Por. Knob Jap'd. ₩ gro 14.00 net
" " Nickel-Plated...₩ gro 27.00 net

Sash Weights.—Solid Eyes, in 500 ℔ lots and over.....₩ ℔ 2½c net

Sausage Stuffers or Fillers.
Miles.....₩ doz $20, dis 30 %
Perry.....₩ doz, No. 1, $15; No. 0, $21, dis 25 %
Braw Cut No. 4.....each $30.00, dis 20 %
Enterprise Mfg. Co.....dis 15 %
Silver's.....dis 25 %

Saws.
Disston's Circular.....dis 35 %
" Mill.....dis 35 %
" Cross Cut.....dis 20 %
" Hand, Panel, Rip, &c.....dis 20 %
Boynton's Lightning, Cross Cuts, new list.....dis 20 %
" One-Man, all lengths, " .....dis 20 %
" Billet Webs, 30 in. " .....dis 25 %
" Lightning Buck Saws X Par.....dis 35 %
" Lightning Hand, Panel and Rip.....dis 25 %
Wheeler & Clemson Mfg. Co.'s Hand.....dis 20 %
W. M. & C. Mfg. Co. Cross-Cuts, except Monarch, dis 20 %
Livingston's Butcher and Kitchen.....dis 20 %
" Framed Wood—
Nos.... 101 102 103 104 105
Per doz..$10.00 8.50 10.00 7.50 6.25 net

Saw Frames.
White, Vermont.....₩ doz $1.35, dis 25 %
Red, Polished and Varnished.....₩ doz $2.00, dis 25 %
Saw Rods.....$10 list dis, 10&10 %

Saw Sets.
Boynton's Patent X Cut, per doz. $12.00; Hand Saw, per doz., $10.00.....dis 20 %
Stillman's Genuine.....₩ doz $3.60@$4.90 net
" Imitation.....₩ doz $3.25, dis 20&10 %
Common Lever.....per doz $2.00, dis 20&10 %
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's.....No. 1, $8.50; No. 2, $6.50, dis 30 %
Hammer, Hotchkiss.....$6.50, dis 10 %
" Bemis & Call Co.'s New Pat.....dis 40&5 %
Bemis & Call Co.'s Lever & Spring nammer..dis 30&5 %
" " Plate.....dis 10 %
" " Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00. dis 50&10 %
" Imitation.....$7.00. dis 10 %
Hart's Patent Lever.....dis 20 %
Disston's.....dis 20 %

Scales.
Hatch, Counter, No. 171.....₩ doz $36. dis 15&10 %
" Tea, No. 161.....₩ doz $15.00 dis 33⅓ %
Union Platform.....$6 00. dis 40 %
Fairbanks'.....dis 20 %
Buffalo Scale Co.....dis 40 %
Howe's.....dis 40&5 %
Chatillon's Grocers'.....dis 40 %
" Eureka.....dis 25 %
Family Universal.....dis 50 %
" Favorite.....dis 40 %
" Turbull's.....dis 40 %
Scale Beams, Chatillon's list.....dis 10 %
" Sargent's list.....dis 35&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.50.dis 20&10 %
Box, 1 Handle.....₩ doz $5.00, dis 10 %
" 2 " .....₩ doz 6.00 dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 20&10 %
Ship (common).....per doz $3.00 net
" (Providence Tool Co.....dis 10 %

Screw Drivers.
Douglass Mfg. Co.....dis 20&10&10 %
Disston's.....dis 50 %
Disston's Patent Excelsior.....dis 50 %
Buck Bros.....dis 25 %
Stanley Rule & Level Co's., Varnished Hdls..dis 45&10 %
" " " Black Handles...dis 35&10 %
Sargent & Co.'s.....dis 40&10 %
Gay's Double Action Ratchet per doz., 4 in., $9.00; 5 in., $10.20; 6in., $12.00 dis 30 %

Screws.
Flat H'd Iron.....dis 35 %
Round Head Iron.....dis 25 %
Flat Head Brass.....dis 25 %
Round Head Brass.....dis 10 %
Brass and Silver Capped.....dis 40 %
Japanned, list of Plain Screws.....dis 20&10 %
Lag or Common Coach.....dis 40@45 %
Coach Patent Gimlet Point, List per 100....dis 40@45 %
Bed.....dis 5@10 %
Machine, Flat Head, Iron, Am. Screw Co.....dis 60 %
" Round Head, Iron " .....dis 55 %
Bench, Iron.....dis 40&10 %
" Wood, Beech .....₩ doz $3.00, dis 15 %
" Hickory.....dis 20&10 %
Hand.....dis 20&10 %
Hand Rail, Sargent's.....dis 55&10 %
" " Humason, Beckley & Co's.....dis 33⅓ %
" " Am. Screw Co.....dis 35 %
Jack (Wilson's).....dis 35 %

Screw Window Balances.
R. B. Huguniu's, Single gro., $23.94; 5 gro. $22.68, dis 5 %

Shears and Scissors.
Cast Iron, (American).....dis 50&10 %
Pruning.....see Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....dis 15 %
Cast Steel, List, Nov. 28, 1879.....dis 50 %
Seymour's " " .....dis 60 %
Heinsch's " " .....dis 60 %
" Tailors' Shears.....dis 33⅓ %

Sheaves.
Sliding Door, M. W. & Co., list.....dis 30&2 %
" R. & E. list.....dis 60&10&2 %
" Patent Roller.....dis 10 %
" " Hatfield's ..dis 55&10&2 %
" Russell's Anti-Friction ...dis 55&10&2 %
" Moore's Anti-Friction.....dis 40 %
Sliding Shutter, R. & E. list.....dis 60&10 &2 %
" " Sargent's list.....dis 50&10 %
Moore's Anti-Friction (Hanging).....dis 40 %
Philadelphia Hanging.....dis 40&5&2 %

Shovels and Spades.
Ames, New list Jan. 26, 1880.....dis 10 %
Hussey Binns & Co., Patent.....dis 15 %
" Association List.....dis 5 %
Old Colony (changes in list Oct. 15, '79).....dis 15 %
Remington's (Lowman's Patent).....dis 25 %
Rowland's.....dis 40 %
Griffiths.....dis 40 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 50&10&2 %
Polished Steel " " .....new list, dis 30&5&10&2 %

Sintes.
Square Frame.....by case.....dis 70 %
Less than a case.....dis 65&10 %

Spoke Shaves.
Defiance Metallic.....dis 20&10 %
Iron.....dis 30 %
Wood.....dis 30 %
Bailey's (Stanley R & L. Co.) new list..... dis 20&10 %

Spoke Trimmers.
Bonney's.....₩ doz $10.00 dis 40&5 %
Stearn's.....₩ doz $10.00, dis 40 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 60&10 %
Douglass'.....₩ doz $9.00, dis 15 %

Spoons.
Pat. Thread Basting.....dis 30 %
" Riveted Table and Tea.....dis 40 %
Solid Table and Tea.....dis 50 %
Britannia.....dis 50 %
The Wm. Rogers Mfg. Co.....dis 33⅓&25 %
Reed & Barton.....dis 33⅓&25 %
Hall & Elton.....dis 33⅓&25 %
Holmes, Booth & Haydens.....dis 33⅓&25 %
German Silver.....dis 25&10 %
Cast Steel, Sil. Plated.....dis 33⅓ %
Tin (P. S. & W.), Teas.....$1.25 ₩ gross, net
" " Tables.....$2.00 ₩ gross, net
Tin Cowles Hdw Co.).....dis 10 %
" " case lots.....dis 20 %

Stocks and Dies.
"Lightning" Screw Plate.....dis. 10 %

Stone.
Hindostan Hacker Stone.....₩ gross $12.00 dis 10 %
Gand Stone.....₩ ℔ 6c. dis 33⅓&10 %
Washita Stone.....No 1, ₩ ℔ 18c net
" " No 2, ₩ ℔ 15c net
" Slips.....No. 1, ₩ ℔ 36c net
Washita Stone (Boyd & Chase).....No. 1 ₩ ℔ 15c net
" " Slips (Boyd & Chase).....30c net
" " mo'ted (Boyd & Chase) 0, 7 & 8 in, dis 30 %
" " No. 2.....₩ ℔, 13c, net
" " No. 2.....₩ ℔ 13c net
Arkansas Stone No. 1, 4 to 6 in.....₩ ℔ $1.35 net.
" " No 1, 6 to 9 in .....℔ ₩ $2.00 net
Turkey Oil Stone (Boyd & Chase)....4 to 8in, $1.00 ₩ ℔, dis 10 %
" Slips " ....$2.50 ₩ ℔, dis 10 %
Lake Superior (Boyd & Chase).....₩ ℔ 20c, dis 10&5 %
" " Slips " .....₩ ℔ 45c, dis 10&5 %
Grindstones, Family, Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₩ gross $5.75 net
Gem.....₩ gross $4.50, dis 10 %
Gold Medal.....₩ gross $5.00, dis 25 %
"Mirror".....₩ gross $6.00, dis 5 %
Ruby.....₩ gross $4.75, net
Rising Sun.....₩ gross $5.75, net
Dixon's Plumbago.....₩ ℔ 8c. net

Squares.
Steel.....dis 50 %; full cases, dis 50&10 % } 2 %
Iron.....dis 50 %; full cases, dis 50&10 % } cash
Nickel Plated.....add $2.50 @ $4.00 ₩ doz, net }
Try Squares and T Bevels.....dis 45&10 %
Star Try Squares and Bevels.....dis 35 %
Disston's Try Squares and T Bevels.....dis 50 %
Winterbottom's Try and Mitre.....dis 20&10 %

Tacks, Brads, &c.
List of Oct. 21, 1879:
Tinned Swedes Tacks.....dis 35 %
Tinned American " .....dis 45 %
Swedes Tacks, all kinds.....dis 20 %
Copper Tacks and Nails.....dis 25 %
Swedes Hungarian Nails.....dis 20 %
American " " .....dis 20 %
Gimp and Lace Tacks.....dis 20 %
Finishing Nails.....dis 15 %
Trunk and Clout Nails.....dis 15 %
Common and Patent Brads.....dis 10 %
Basket Nails.....dis 15 %
Brush Tacks.....dis 10 %
Leathered Carpet Tacks.....dis 20 %
American Cut Tacks.....dis 20 %
Cigar Box Nails.....dis 20 %
Chair Nails.....dis 20 %
All other Tack List goods.....dis 20 %
Double-Pointed Tacks.....dis 40&5 %
Extra 10 on all.

Tap Borers.
Common and Ring.....dis 15 %
Ives' Tap Borers.....dis 15&10 %
Enterprise Mfg. Co.....dis 15 %

Tapes, Measuring.
American.....dis 10 %
Spring Tapes.....dis 25&10 %

Thermometers.
Tin Case.....dis 70 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 15 %
Wood Bottom.....₩ doz $12.00, dis 33⅓ %
All Iron.....₩ doz $10.50, dis 40 %
Nashua Lock Co.'s.....₩ doz $18.00, dis 50 %

Toe Calks.—Winsted.....₩ ℔ 9c. dis 4 %

Tinners' Tools and Machines.
Machines (P. S. & W.).....list add 12½ %
Tools (P. S. & W.).....dis n't

Traps.
Game Newhouse.....dis 30 %
" Newhouse Pattern.....dis 45 %
" Blake's Patent.....dis 40 %
Mouse, Wood, Choker.....₩ doz holes, 10@50
" Round Wire.....₩ doz $1.50, dis 10 %
" Cage " .....₩ doz $2.50. dis 10 %
" Catch-em-alive.....₩ doz $2.50, dis 10 %
Rat, "Decoy".....per doz $10.00, dis 10 %

Trowels.
Lothrops Brick and Plastering.....dis 10@15 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 15 %
Peace's Plastering.....dis 30 %
Clement & Maynard's.....dis 10@15 %
Rose's Brick.....dis 15 %
Brades' Brick.....dis 20 %
Worrall's Brick and Plastering.....dis 10@15 %
Garden.....dis 45 %

Triers.
Butter and Ch ese.....dis 25%

Vises.
Solid Box.....List of July 1, '79 dis 25 %
" "Crown" (A. H. Hildick) 40 to 100 ℔, 15c net
" Peter Wrights.....15c net
Parallel, Parker's.....dis 10 %
" Wilson's.....dis 20 %
" Howard's.....dis 25 %
" Merrill's.....dis 15 %
" Sargent's.....dis 40&10 %
" Trenton.....dis 20 %
" Backus and Union.....dis 25 %
" Fisher & Norris.....dis 15&10 %
" Stevens'.....dis 25 %
" Simpson's Adjustable.....dis 25 %
"Family" List.....net
Saw Filers, Bonney's.....₩ doz $24.00, dis 20&10 %
" Stearn's.....dis 20&10 %
" Hopkins'.....₩ doz $17.50 dis 10 %
Lowell Hand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 20 %

Washer Cutters.
Smith's Patent.....₩ doz $12.00 dis 20 %
Johnson's.....₩ doz $12.00. dis 33⅓ %
Penny's.....₩ doz $14.00 and $16.00. dis 45 %
Appleton's.....₩ doz $3.00, dis 20&10 %

Washers.—See Nuts and Washers.

Well Wheels.—Revised list.....dis 60&10%

Wire.
Brass and Copper..... List of Jan. 14, 1880....dis 20 %
Bright and Annealed..... Nos. 0 @ 18. dis 35 @ 37½ %
" " .....Nos. 19 @ 20, dis 45 @ 47½ %
.....Nos. 27 @ 30, dis 50 @ 52½ %
Coppered.....Nos. 0 @ 18.dis 30 @ 32½ %
Galvanized, Nos. 0 to 6.....₩ ℔ 10c. dis 25 @ 27½ %
" Nos. 7 to 18.....market list, dis 15 @ 17½ %
Tinned, Nos. 0 to 18.....dis 25 @ 27½ %
Cast Steel.....dis 25 @ 40 %
Tinned Broom Wire, Nos. 18 to 26.....dis 37½ @ 40 %
Annealed Fence, Nos. 8 and 9 .....dis 34 @ 37½ %
" Grape, Nos. 10 to 14. .....dis 35 @ 37½ %
Galvanized Telegraph, Nos. 7 to 9 .....₩ ℔ 9c
" " Nos. 10 and 11.....₩ ℔ 10c
" No. 12.....₩ ℔ 10½c
Fence Staples.....₩ ℔ 7½@ 7½c
" Staples, Galvanized.....₩ ℔ 8¼ @ 8½c
Stubs Steel Wire.....$7.00 to 2
Japanned Barb Fence.....₩ ℔ 14c
Galvanized " .....₩ ℔ 15c
Steel Music Wire, Nos. 12 to 27.....₩ ℔ $1.25, net
Turner & Seymour Mfg. Co., Picture Wire..dis 80&20 %
Judd's Picture Wire.....dis 80&20 %
Clothes Line Wire, Galvanized.....₩ coil 45 %
Wire Cloth, green and drab.....₩ sq. ft, 3¾ @ 4 c net

Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S,".....list J an., 1880, dis 20
" Diagonal.....dis 20
Coes 'Genuine.....dis 33⅓ %
" "Mechanics".....dis 33⅓&10 %
" Pattern, Malleable.....dis 05 %
Girard Standard.....dis 40 %
Girard Agt.....50 %
Davis' Patent Duplex.....new list, dis 20 %
Bemis & Call's Patent Combination.....dis 20 %
" " Merrick's Pattern.....dis 35 %
" " Briggs' Pattern.....dis 25 %
" " Cylinder or Gas Pipe.....dis 40 %
Van Wagoner & Williams' Basin.....per doz $4.50
Aiken Pocket (Bright).....$6.00, dis 60&10 %
The Favorite Pocket (Bright).....per doz $8, dis 60 %
Webster's Pat. Combination.....dis 35 %

Wringers. Per doz.
Universal, XX No. 2½..... 69.00
" " No. 3..... 66.00
" " No. 1½..... 74.00
" " No. 1..... 93.00
" " No. 8..... each 14.00
" " No. 12..... " $20.00
" " No. 18..... " 28.00
" " No. 22..... " 32.00
Peerless, No. 0, no Cogs..... 54.00
" No. 1, " 57.00
" No. 2½, with Cogs..... 63.00
" No. 2, " 66.00
" No. 3, " 74.00
" No. 4, " 96.00
nique, No. 0..... 54.00
" No. 1..... 57.00
Crown No. 2..... 57.00
" No. 2½..... 66.00
" No. 3..... 72.00
Eureka, No. 1..... 60.00
Novelty, No. 10, with Cog Wheels..... 63.00
" No. 2, " 66.00
Excelsior, No. A, with Folding Bench..... 78.00
" No. E, for Set Tubs..... 89.00

Stamped Tinware.—New List Jan. 10, 1880.
Common Stamped Ware.....dis 15 %
Stamped Deep and Retinned Ware.....dis 25 %

Steel.

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STEEL Gautier Steel.

See Page 3.

Steel.

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AND

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Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

Established 1864.

GARDNER BROTHERS,

Manufacturers of

STANDARD SAVAGE FIRE BRICK, TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and Miners and Shippers of Fire Clay.

OFFICE: 116 Smithfield St., Pittsburgh, Pa.
WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

FIRE BRICK,

Buffalo, N. Y.

MILLER'S BRICK PRESSES

(Established 1844),

FIRE and RED BRICK,

And Brickmakers' Tools in General.

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ALUMINA and SILICA

FIRE BRICKS

Works, BROOKLYN, on the East River.

Through Cars, Canal Boats and Vessels loaded direct from the Works to all points.

PURE SILICA FIRE BRICK,

MADE BY THE

Landore Siemens Company,

Specially for OPEN-HEARTH FURNACES.

More "heats" obtained from them than from any other Bricks known.

Imported, to order only, by

PHILIP S. JUSTICE, Sole Agent in United States,

14 NORTH FIFTH STREET, PHILADELPHIA.

GROOM SHOVEL CO.,

MANUFACTURERS OF SUPERIOR

SHOVELS, SPADES AND SCOOPS.

SPECIALTIES:

Mining Shovels, Hammered Solid Steel Railroad Shovels and Spades, Locomotive, Grain and Sand Scoops.

OFFICE, 912 Washington Ave., SAINT LOUIS, MO.

FACTORY, 1031 North Main St.,

BRADSTREET'S

A SEMI-WEEKLY JOURNAL

DEVOTED TO

Trade, Commerce, and Finance.

THIS JOURNAL covers a ground the extent of which is occupied by no other publication, and forms an invaluable work of reference to the merchant and manufacturer.

REGULAR and RELIABLE CORRESPONDENCE, furnished by experts expressly for this journal, from all the principal trade centres of this country is embraced in its columns.

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CREASEY'S ICE BREAKER.

Patented Oct. 29, 1878.

The Simplest, Cheapest and Best Ice Breaker ever offered to the Public.

Manufactured and Sold By

JOSEPH S. LOVERING WHARTON,

Southeast Cor. 15th and Wood Sts.,

Send for circulars. PHILADELPHIA.

Wiley & Russell Mfg. Co.,

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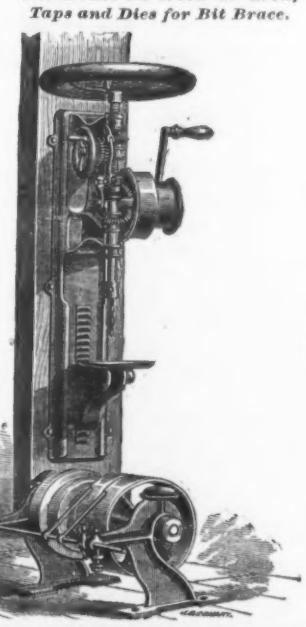
LIGHTNING Screw-Cutting Machinery and Tools.

Bolt Cutters for Hand or Power, Lightning Screw Plates cutting from Wire Sizes to 1 1-2 inch. Pipe Taps and Dies, Taper Reamers for Use in Bit Brace on Wood or Iron, Taps and Dies for Bit Brace.



These Drilling Machines with or without Screw-Cutting Attachment, as desired.

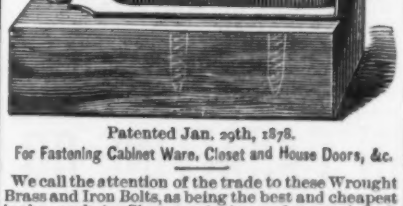
Green River Drills for either hand or power.
" Tire Benders.
" Tire Upsetters.
" Horse Shoers' Machines.
" Tire Measuring Wheels.

Tire Bolt Wrenches, Nut Wrenches, &c., &c.

Special Screw Plates for use with stock or in the Bit Brace.

Send for Illustrated Price List.

HYATT'S PATENT SPRING BOLT.



Patented Jan. 29th, 1878.

For Fastening Cabinet Ware, Closet and House Doors, &c.

We call the attention of the trade to these Wrought Brass and Iron Bolts, as being the best and cheapest in the market. Sizes, two inches and upward, both plain and neck bolts. Two screws fasten the bolt and bed-plate to the wood; no others are required; the bed-plates are made of brass, from which the spring is cut and raised, upon which the bolt slides with an easy, elastic movement, saving expense of screws and producing a strong, handsome and cheap Bolt. Price list furnished on application.

BRASS GOODS MFG. CO.,

43 Chambers St., New York.

We also manufacture all kinds of Brass and Tin Goods, Drop Bases, Thimbles and Roses for Door Knobs, Plate Escutcheons, Brass Labels, Patent Mirror Business Cards, &c.

PECK & BEMIS. Jobbers of Rubber Goods, manufacturers of Leather Belting and Leather Fire Hose. Sole agents for Hoyt's celebrated Oak Tanned Belting, also N. Y. Belting and Packing Co.'s goods. Ladies' and Gents' Water-proof Garments. 176 Superior St., Cleveland, O.

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PHILADELPHIA, PA.,

Manufacturers of

FOUR GRADES OF

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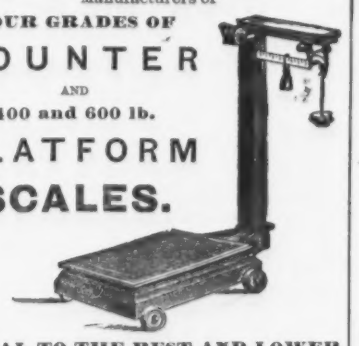
AND

400 and 600 lb.

PLATFORM SCALES.



EQUAL TO THE BEST AND LOWER IN PRICE.

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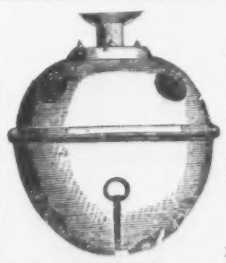


Established 1838

Bevin Bros. Mfg. Co.,

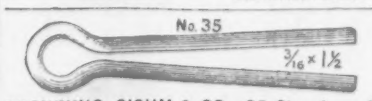
Easthampton, Ct.

Manufacturers of

SLEIGH BELLS,

House, Tea, Hand, Gong Bells, &c.

Bell Metal Kettles.



BROWNING, SISUM & CO., 85 Chambers St., Manufacture

Belt Hooks, Cotters, Spring Keys, D Rings, Staples, and everything pertaining to wire bending.

Factory, BROOKLYN.

John T. Lewis & Bros.

No. 231 South Front St.,

PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil,

AND PAINTERS' COLORS

Brooklyn White Lead Co.

TRADE MARK

White Lead, Red Lead & Litharge.

89 Maiden Lane, NEW YORK.

FISHER HOWE, TREASURER.

JOHN JEWETT & SONS

Manufacturers of the well-known brand of

WHITE LEAD.

JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.

ATLANTIC WHITE LEAD. PURE. WARRANTED ROBERT COLGATE & CO.

TRADE MARK.

The Atlantic White Lead and Linseed Oil Co.,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead, Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York

DUNBAR BROS.,

Manufacturers of

Clock Springs and Small Springs

of every description, from best Cast Steel.

BRISTOL, CONN.

W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized & Ship Chandlery Hardware,

No. 33 Chambers St., New York.

ORGANS 15 Stops, 3 set Reeds, Stool, Book, only $68. Pianos, Stool, Cover & Book only $143.75. Paper free. D. F. BEATTY, Washington, N. J.

PHILADELPHIA.

(Corrected Weekly by Lloyd, Supplee & Walton.)

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wrights, ₱ lb.....11c net
Over 250 lbs.....11½c net
Eagle (American).....10c ₱ lb—dis 20 %

Apple Parers.
Reading No. 72.....per doz $5.00 net
" No. 74....." 6.00 net
" No. 75....." 7.00 net
" No. 76....." 7.50 net
Peach Parers....." 15.00 net
Little Favorite, corer and slicer....." 7.50 net
Lots of 10 to 25 dozen special price.

Axes.
Hunt's Kentucky and Yankee.....per doz $11.00
Mann's Red Warrior....." 11.00
Richland Chief....." 10.00
Beveled Axes.....add 50c " net
Double Bit Axes.....net " 22.00

Augers and Auger Bits.—New List January 1.
Bates' Nut Augers.....dis 40 %
Cook's Augers.....dis 40&10 %
Watrous' Ship Augers.....dis 15 %
Benjamin Pierce Auger Bits.....dis 35 %
Griswold Auger Bits.....dis 40 %
Cook's " .....dis 40&10 %
Jennings' " .....dis 10, 10&10 %
Bonney's Pat. Hol. Augers, list $48 ₱ doz..dis 20&10 %
Stearns' Pat. Hol. Augers, list $45 ₱ doz....dis 20&10

Balances.
Light and Common.....dis 15&10 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells.....dis 55&10 %
Swiss Pattern Hand Bells.....low list dis 40&10 %
Connell's Door Bells.....dis 30 %
Gt. Western & Kentucky Cow, new list.....dis 40 %

Bolt and Rivet Clippers.
Chambers' No. 1. for ⅜ bolt.....each, $7.50 } dis 15 %
" No. 2, " ½ " ..... " 9.00 }
" No. 3, " ⅝ " ..... " 12.00 }

Boring Machines.
Upright, without Augers.....List 5 50 } dis 33⅓ %
Angular, without Augers..... " 6.75 }

Bolts.—Eastern Carriage Bolts.....dis 60 & 5 %
Philadelphia .....new list dis 50 %
Stanley, Wrought Shutter.....dis 45 %

Braces.—Barber's.....dis 40& 5 %
Backus.....dis 50 @ 50&10 %
Spofford.....dis 50&5 %
American Ball.....dis 40&10 %

Butts.—Cast Fast Joint, Narrow.....dis 10&10 %
" " Broad.....dis 20&10 %
Cast Loose Joint, Narrow.....dis 25&10 %
" " Broad.....dis 25&10 %
" Acorn, Loose Pin.....dis 25&10 %
" Jap'd.....dis 30&10 %
" Mayer's Loose Joint.....dis 25&10 %
Wrought Loose Pin.....dis 35&10 %
" Table Hinges and Back Flaps.....dis 25&10 %
" Narrow, Fast.....dis 25&10 %
" Loose Joint.....dis 25&10 %

Blind Butts.
Parker.....dis 50&10 %
Clark.....dis 50&10 %
Shepard.....dis 50 %
Lull & Porter.....dis 55&10 %
Huffer's.....dis 35&10 %

Chains.—German Halter and Coil, new list Oct. 22, 1879.....dis 20 %
Galvanized Pump.....₱ lb 11c net
Best Proof Coil Chain—English.

₱ lb	13	11½	9¼	8½	8	7¾	gold
	3-16	¼	5-16	⅜	7-16	½	in.

Chisels.—Socket Framing.....dis 55&10 %
Socket Firmer.....dis 55&10 %
Butcher's.....$5.00 to £ gold

Casters.—Bed.....dis 15&10 %
Plate.....dis 15&10 %

Coffee Mills.—Box and Side, new list Jan. 1, 1880.....dis 35 %
Enterprise.....dis 10 %

Cutlery.—Walden Pocket.....new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s.....dis 55&10 %
Adjustable Handle.....dis 15 %

Fry Pans.
Tinned.....dis 45 %

₱ doz.	$3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No....	0	1	2	3	4	5	6	7	8

Burnished.....dis 45 %

₱ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
Fo....	0	1	2	3	4	5	6	7	8

Files.
Nicholson.....dis 20 %
Disston.....dis 20 %
Butcher.....$4.50 £
Spencer.....$4.50 @ 4.75 £

Fluting Machines.
Eagle—3¼ in. roll.....each, $2.15, dis 10 %
" —3¼ in. roll..... " 2.85 net
Crown—4½ in. roll..... " 3.50 } dis 10 %
" —6 in. roll..... " 4.00 }
" —8 in. roll..... " 9.50 }
Geneva Fluter.....dis 20 %
Favorite com Fluter & Sad Iron.....₱ doz $10.50 net

Hammers.
Yerkes & Plumb's, new list.....dis 15 %

Hatchets.
Yerkes & Plumb, new list.....dis 15 %
Hunt.....dis 5 %

Hinges.
Strap and T.....dis 25&10 %

Horse Nails.

Nos.	5	6	7	8	9	10
Ausable	30	27	25	24	23	22
" Pol'ed & P't'd and Blued and Pointed.	31	28	26	25	24	23
Globe.....New list.	26	23	21	20	19	18
Clinton	22	20	19	18	17	
" Polished & Pointed	23	21	20	19	18	

Porter, all sizes.....₱ lb 15c. net
Discount on Ausable and Clinton, 20 %; Globe, 10%

Locks and Knobs.
Branford.....dis 30&2 %
Gayford Cabinet.....dis 10&2 % c sh
American Padlocks.....dis 10&5 % cash
Scandinavian Padlocks.....dis 50 %

₱ doz.	$5.00	5.50	6.50	7.50	8.50	10.50	12.50 } dis 50 %
No.....	57	58	59	60	61	62	63 }
₱ doz.			$18.00		26.00		33.00 } dis 50 %
No.			64		65		66 }

Lanterns.
Square Candle and Oil.....₱ doz
Tubular.....No. 0, $5.05; No. 1, $11.30 ₱ doz net
Globes, 35 cents extra per doz. net.

Lawn Mowers.—Pennsylvania.....dis 30&10 %
Philadelphia.....dis 30&10 %
Excelsior.....dis 30&10 %

Lawn and Garden Pumps.
Holland Patent.....List $5.00 dis 10 %

Mattocks.
Long and Short Cutter.....new list
Pennsylvania Pattern.....per doz

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 15 %
Stebbins' Gates.....dis 50&10 %
Lincoln's " .....dis 50&10 %
Landers, Frary & Clark's Petroleum.....dis 20&10 %
Brass Liquor Cocks, new list July 1, 1880..dis 25&10 %
Cork Lined " .....dis 70 %

Meat Cutters.—Pennsylvania Meat Cutter..dis 40 %
Dixon's.....dis 10 %
Woodruff.....dis 10 %
Stowe .....dis 10 %
Hale's..... new list, dis 40, 2&10 cash
American.....dis 25 %
Stuffers.....dis 10 %
Enterprise Stuffers.....dis 15 %

Planes.—Ohio Tool Co.....dis 25 %
Sciotto.....dis 30 % } 10 % cash
Auburn.....dis 25 % } in 10 days.
New York Tool Co.....dis 30 %
Bailey.....dis 20&10 %

Plane Irons.—Ohio Tool Co.....dis 10&5 %
Butcher's.....£, $4.50

Plumbs and Levels.
Stanley's Adjustable.....dis 60&10 %
" Non-Adjustable.....dis 60&10 %

Picks.—New list.....

Pumps.—Bickford.....$5.00, dis 10 %

Rules.—Stanley Boxwood.....dis 55&10 %
Stanley Ivory.....dis 45&10 %

Steelyards.—Hart's Pattern.....dis 30&10 %

₱ doz.	$14.50	17.75	21 00	26.50	31 00	35.50
Lbs.....	60	100	140	200	250	300

American Pattern.....dis 30&10 %

₱ doz.	$8.00	10.25	13.75	16.50	16.75	19.50
Lbs.....	60	100	140	200	250	300

Squares.
Steel and Iron.....dis 50 %; full case, dis 50&10 %
Try Squares, Stanley.....dis 45&10 %
Disston's Try Squares.....dis 50 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₱ doz $9.00 net
Clipper No. 10, Bronzed Blade, Boxed and Sharpened.....₱ doz $8.50 net
Clipper No. 5, Painted Red, Boxed and Sharpened.....₱ doz $8.00 net

Saws.—Disston's Hand, Panel and Rip.....dis 20 %
Disston's Circular.....dis 35 %
" Cross-Cut No. 2, Plain Tooth.....dis 20%
" " Patent Tooth.....dis 20%
" " Champion Tooth.....dis 20%
Boynton's Lightning Cross Cut, new list.....dis 20 %
" One Man, all lengths, " .....dis 20 %
" Billet Webs, 30 inch, " .....dis 25 %
" Lightning Buck Saws, cross bar...dis 25 %
" " Hand, Panel and Rip....dis 25 %

Shovels and Spades.
Rowland.....dis 40 %
Oliver Ames & Sons, new list.....dis 10 %

Sad Irons.—4 to 10 lbs.....₱ lb 4½c
Mrs. Potts' Patent.....dis 20 %

Stone.—Arkansas Oil Stone.....₱ lb $2.00 net
Washita Extra.....₱ lb 27c net
" No 1. " 18c
" No. 2. " 15c
" Slips. " 36c
" Axe. " 18c net
Turkey Oil Stone No. 1.....₱ lb $1.00 net
Hindostan Oil Stone No. 1.....₱ lb 60c } dis 30 & 10 %
" Axe Stone..... " 80c }
" Slips..... " 100 }

Screws.
Flat Head Iron.....dis 35 %
Brass.....dis 25 %
Round Head Brass.....dis 15 %
" Iron.....dis 25 %

Spoons.
Plated.....dis 33⅓&5 %
German Silver.....dis 25 %

Britannia, Boardman's.....dis 55 %
" Parker's.....dis 55 %
Tinned.....dis 10 %

Springs.—Torrey.....₱ doz $2.84 net
Philadelphia....5 in., $8.00; 8 in., $7.00 ₱ doz. dis 25 %
Chatfield No. 1, $2.75; 2, $3.25; 3, $5.00 ₱ doz, dis 33⅓ %
Gem Coil No. 1, Large Jap'd.....₱ doz $3.50 }
" No. 2, Medium Jap'd..... " 2.50 } net
" No. 3, Small Jap'd..... " 2.00 }

Stocks and Dies......dis 10&5 %

Stove Polish.—Gem.....₱ gross, $4.50, dis 5 %
Dixon..... " 5-75 net
Onyx..... " $4.00 @ 4.25 net

Tacks, Brads, &c......dis 20 %
Shoe Nails—4-8, 9½c; 3½-8, 10c ₱ lb..... net
Double Pointed Tacks.....dis 40&5 %

Traps.
Genuine Oneida—Newhouse.....dis 30 %
Im. Oneida—Newhouse list, first qual.....dis 45 %

Vises.—Solid Box, Trenton new list.....dis 25 %

Wrenches.—Agricultural.....dis 50 %
Coes' Genuine.....dis 33⅓ %
" " Mechanics'.....dis 33⅓&10 %
" " Mail Bar.....dis 65 %
Philada. Tool Co., Duplex.....dis 25 %

Wire.
Bright or Ann'd, No. 0 to 18.....dis 35 to 37½ %
" " No. 19 to 26.....dis 45 to 47½ %
" " No. 27 to 36.....dis 50 to 52½ %
Coppered, 0 to 18.....dis 30 to 32½ %
Tinned Broom Wire.....dis 37½ to 40 %
Galvanized, No. 7 to 18....Market List, dis 25 to 27½ %

Wringers.
Peerless No. 2½.....$63.00
" " 2.....66.00
Universal, No. 2½.....63.00
" " 2.....66.00
Novelty, No. 10.....63.00
" " 2.....66.00

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

Flat Bar.

1¼ to 4 by ⅜ to 1 inch.....2.50c
4¼ to 6 by ⅜ to 1 " 2.60c
1¾ to 6 by 1⅛ to 1¼ " 2.90c
1¼ and 1¾ by ⅜ to ⅝ " 2.60c
1 and 1⅛ by ⅜ to ⅝ " 2.70c
⅝, ¾ and ⅞ by ⅜ to ⅝ inch.....2.90c

Rounds and Squares.

1 to 1⅞	2.50c	⅝ to 9-16	2.70c
2 to 2⅝	2.70c	⅝ to 7-16	2.90c
2¾ to 3¼	3.00c	⅜	3.10c
3⅜ to 4	3.50c	7-16	3.30c
4¼ to 5	4.00c	¼	3.50c
¾ to ⅞	2.60c	3-16	5.50c

Oval Iron.

⅞ to 1¼	2.90c	⅛	3.30c
⅝ to ⅞	3.10c	⅜	3.70c

Half Oval and Half Round.

⅞ to 1¼ inch	3.20c	¼ inch	4.00c
⅝ to ¾ "	3.70c	⅜ "	5.50c

Horse Shoe.

⅝ to 1⅜ by 5-16 to ⅞ inch.....3.50c

Wagon Box Iron.

¼ Inch, Nos.	13 and 14		3.70c
⅜ " "	11 and 12		3.50c
⅜ " "	13 and 14		4.00c
⅜ " "	11 and 12		3.80c
½ " "	13 and 14		4.40c
½ " "	11 and 12		4.10c

Heavy Bands.

3½ to 6 by ¼ and 5-16 inch.....2.7
1¾ to 3¼ by ¼ and 5-15 " 2.7
1 to 1⅜ by ¼ and 5-16 " 2.8
⅝ to ⅞ by ¼ and 5-16 " 3.0
⅝ and ½ by ¼ and 5-16 " 3.5

Light Bands.

1¼ to 6 by ⅛ to 3-16 .....3.0
1¼ to 6 by Nos. 11 and 12.....3 1
1 to 1¾ by ⅛ to 3-16.....3.1
1 to 1¾ by Nos. 11 and 12.....3.2
⅞ and 13-16 by ⅛ to 3-16.....3.4
⅞ and 13-16 by Nos. 11 and 12.....3.5
¾ and 11-16 by ⅛ to 3-16.....3.7
¾ and 11-16 by Nos. 11 and 12.....3.8
⅝ and 9-16 by ⅛ to 3 16.....4.0
⅝ and 9-16 by Nos. 11 and 12.....4.1
½ inch by ⅛ and 3-16.....4.3
½ inch by Nos. 11 and 12.....4.4

Hoop Iron.

1¼ to 4, Nos. 13, 14 and 15.....3.3
1¼ to 2, Nos. 16, 17 and 18.....3.4
1¼ to 2, No. 19.....3.5
1¼ to 2, No. 20.....3.6
1¼ to 2, No. 21.....3.7
1¼ to 2, No. 22.....3.8
15-16, 1, and 1⅛, Nos. 13, 14 and 15.....3.5
15-16, 1, and 1⅛, Nos. 16, 17 and 18.....3.6
15-16, 1, and 1⅛, Nos. 19 and 20.....3.7
15-16, 1, and 1⅛, No. 21.....3.8
15-16, 1, and 1⅛, No. 22.....3.9
⅞, Nos. 13, 14 and 15.....3.7
⅞, Nos. 16, 17 and 18.....3.8
⅞, Nos. 19 and 20.....3.9
⅞, No. 21.....4.0
⅞, No. 22.....4.1
13-16, Nos. 13, 14 and 15.....3.9
13-16, Nos. 16, 17 and 18.....4.0
13-16, Nos. 19 and 20.....4.1c
13-16, No 21.....4.2c
13-16, No. 22.....4.3c
¾, Nos. 13, 14 and 15.....4.0c
¾, Nos. 16, 17 and 18.....4.1c
¾, Nos. 19 and 20.....4.2c
¾, No. 21.....4.3c
¾, No. 22.....4.4c
11-16, Nos. 13, 14 and 15.....4.2c
11-16, Nos. 16, 17 and 18.....4.3c
11-16, Nos. 19 and 20.....4.4c
11-16, No. 21.....4.5c
11-16, No. 22.....4.6c
⅝, Nos. 13, 14 and 15.....4.4c
⅝, Nos. 16, 17 and 18.....4.5c
⅝, Nos. 19 and 20.....4.6c
⅝, No. 21.....4.7c
⅝, No. 22.....4.8c
⅝, No. 23.....4.9c
9-16, Nos. 13, 14 and 15.....4.6c
9-16, Nos. 16, 17 and 18.....4.7c
9-16, Nos. 19 and 20.....4.8c
9-16, No. 21.....4.9c
9-16, No. 22.....5.0c
9-16, No. 23.....5.1c
½ inch, Nos. 13, 14 and 15.....4.8c
½ " Nos. 16, 17 and 18.....4.9c
½ " Nos. 19 and 20.....5.1c
½ " No. 21.....5.2c
½ " No. 22.....5.3c
½ " No. 23.....5.4c

The prices under Hoop Iron do not apply to Cotton Ties.

1-10c per lb. extra will be charged for each gauge lighter than the lightest indicated.

1-10c per lb. extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.

1¼ to 2 in., cut to length.

9 to 11 lbs, per set of 6 hoops.....2.5c
8 lbs. and less than 9 lbs. per set of 6 hoops.....3.0c
Less than lbs. per set of 6 hoops.....3.8c

Extras for Cutting to Length all Preceding Iron.

All Iron, including Tire.....1.10c

Tank Iron.

No. 9 and heavier.....3.3c
Plow Slabs.....3.5c
" Wings.....3.8c

Sheet Iron.

	Common.	Charcoal.	Juniata.
No. 10 to 14.....	3.50	5.00	6.50
No. 15 to 17.....	3.80	5.30	6.80
No. 18 to 21.....	4.10	5.60	7.10
No. 22 to 24.....	4.30	5.80	7.30
No. 25 & 26.....	4.50	6.00	7.50
No. 27.....	4.70	6.20	7.70
No. 28.....	5.10	6.60	8.10

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10c extra.

Wood's Patent Planished Sheet.

1st quality (A).....13c | 2d quality (B).....11½c

Galvanized Iron—Juniata.

Nos. 14 to 20	12c	No. 27	15c
Nos. 21 to 24	13c	No. 28	16c
Nos. 25 and 26	14c	No. 29	18c

Discount off list, 7½ %; 2d quality, 20 % off.

Coal Screen Iron.

4¾ by 5⅛ by 5-16.....2.7c | 1 by 5⅛ by 5-16.....4.2c

Angle Iron.

2½, 3, 3½ and 4 inch.....4.0c
1½, 1¾, 2 and 2¼ inch.....4.0c
1¼ inch.....4.1c
1 " 4.3c
1¼ by 1 inch, for Plow Handles.....4.5c
1½ by ¾ " " " 4.5c
1⅜ by ¾ " " " 4.6c

T Rail.

8 lbs. to the yard.....3.4c | 20 lbs. to the yard.....3.5c
12 " " .....3.5c | 28 " " 3.5c
16 " " .....3.5c | 40 " " 3.5c

Splice Joints for 12, 16 and 20-lb. Rail, 50c each; 28 and 30-lb. Rail, 70c each; 40 lb., 80c each.
3½ by ⅜ and ½ Spikes for 20 and 28-lb. Rail.....5.0c
2½ and 3 by ⅜ " " 12 and 16-lb. " 5¼c
2½ by 5-16 " " 8-lb. Rail.....5¾c

Flat Rails.—Punched and Countersunk.

1¼ to 2 by ⅛ to ⅝ inch.....3.7c
1½ by ⅜ and 7-16 inch.....3.9c
1¾ by ⅜, 7-16 and ½ inch.....4.2c

Juniata Nail Rods.....7.2c
Norway 8.7c
Guard Iron, ⅞x⅝x⅜ and ⅞x⅝x⅝.....4.7c
" ⅝x⅝x⅜-16 and ⅞x⅝x⅛.....4.9c
Drag Bars.....4.0c
Dropper Bars.....4.5c
Cylinder and Landside Iron.....3.9c
Plow Beam Iron.....3.7c

Nails.

10d to 60d.....$4.00

Best Quality Refined Cast Steel.

Square, Flat, Octagon and Round.

⅜ to 2 inches, inclusive.....13½c
5-16 and 2⅛ to 3 inches.....14½c
¼ and 3⅛ to 4 " 15½c
7-32 and 4⅛ to 5 " 16½c
3-16 and 5⅛ to 6 " 19½c
5-32 inch.....23½c
⅛ inch.....31½c
Cut to multiples or specified lengths, ½c extra.
Oil Well Steel Forgings.....21½c
No grade of Crucible Tool Steel shall be sold for less than above prices.

Machinery Steel.

	Crucible.	Bessemer & Open Hearth.
Ordinary Sizes, ⅜ to 2 inch Round	8½c	7c
5-16 and 2⅛ to 3 inches	9½c	8c
¼ and 3⅛ to 6 "	10½c	9c
7-32 inch	11½c	10c
3-16 "	13½c	12c

Square, Flat and Octagon, ½c extra throughout the list.
Cut to multiples or specified lengths, ½c extra.

Hammer Cast Steel.

2 inches and under 9c
Above 2 inches 10c

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge..	13½c	11½c	9½c	7c

1c. extra for each additional gauge.
Cut to multiples or specified lengths, ½c. extra.

Miscellaneous Cast Steel.

Auger and Auger Bit.....9c
Axle Steel for carriages and wagons.....9c
Locomotive and Car Axles, Forged.....10½c
Frog Points and Plates.....11c
" Side Bars.....9½c
Pick, plain.....9½c
" and Mattock, beveled.....9½c
Skate Steel.....9c
Table Cutlery.....9c
Pike and Cant Hook.....9½c
Coal and Granite Wedge.....9½c
Roller.....8½c
Spindle, subject to Machinery classification.....9c
Trap Spring Steel.....10c
Forged Crank Pins and Lathe Spindles.....12½c
Piston Rods, plain.....10c
" forged to shapes.....12½c
Slide Bars, plain.....9c
" forged to shapes.....12½c

Crucible, Open Hearth or Bessemer.

Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick.....7½c to 8c
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick.....8½c to 9c
Circulars and semi-circulars, when ordered separately.....9½c to 10c
Smoke Stack, to shape.....9½c to 10c
Locomotive Tank Steel.....7½c

File Cast Steel.

Square, Round, Half Round and Flat Bastard, 8-inch and over.....9c
Mill Saw, 8-inch and over.....9½c
Taper, 3½-inch and over.....11c
Horse and Shoe Rasp.....9½c

Spring Cast Steel.

1 to 4x¼ to ⅝ inch.....8c
⅞ to 3x5-32 to 3-16 inch.....9c
⅞ to 3x10 g. to 20 g.....
⅞ to ⅝x10 g. to 20 g.....
Cut to multiples or specified lengths, ½ cent per lb. extra.
Spiral and Taper, cut to lengths.....8½c

Tire Cast Steel.

1x¼ and over.....8c
1x3-16, ⅞x3-16 and ¼.....8½c
1 and 13-16x⅛ and 5-32, ⅝x3-16 and 5-32.....9c
⅝ and ⅝x⅛ and 3-32 and 12 g.....9½c
Solid Safe Cast Steel.....8c

Agricultural Implement Cast Steel.

Fork and Rake, Crucible.....9c
Horse Rake Steel, cut to lengths, Crucible.....9½c
Hoe, Crucible.....8½c
Corn Stalk Cutter, beveled.....9½c
Beveled Hoe and Shovel Steel in Bars.....9½c
Crucible Plow Steel in slabs.....9c

Bessemer and Open Hearth.

Spring.....6½c
Tire, 3-16 thick and above.....6½c
Toe Calk.....6½c
Plow.....6½c
Axles.....6c
Sleigh Shoe.....6c
Cutter Shoe, cut to lengths and tapered.....7c
Scythe Back Steel.....6½c
Grain Drill Bars.....9c
" Points.....10c
Rolling Coulter Blanks, cut and punched.....11c
Thrasher Steel.....6c
" Teeth.....7c
Rolled Hammer Billets.....6½c
Where Bessemer or Open-hearth Steel can be used in place of Crucible, the difference in price shall not be greater than 1c. per lb., except where especially provided in the list.
Terms.—Four months; 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.

Furnace, Floor and Straightening Plates.....3 c
Housings and Castings not otherwise specified.....3½c
Guide Plates.....4 c
Spindles and coupling boxes.....3½c
Sand Rolls and Pinions, large size.....3½c
" " small size.....4½c
Pipe Mill Castings.....5 c
Rolling Mill Castings under 50 lbs.....4 c
Spur and Bevel Wheels, large.....4½c
" " small.....4½c
Pulleys up to 30 inches.....3½c
" over 30 inches.....3½c
Engine Castings, light.....3½c
" " heavy.....3½c

Chilled Rolls.

6 to 7 in. diam., 7 to 20 in. long.....3½c
8 to 15 in. " 8 to 40 in. " 3½c
15 to 24 in. " 15 to 72 in. " 3½c
24 to 31 in. " 72 to 108 in. " 3½c

Horse Shoes, Etc.—In 100 keg lots.

Juniata Horse Shoes.....per keg, $6.00
" Mule " 7.00
" "Roadster" pattern....." 6.25
Steel Toe Calks.....8c per lb., less dis. on quantities

White and Red Lead.

Strictly Pure White Lead in Oil, in kegs, in lots of 500 lb and over, 9c; less than 500 lb. 9¼c in 25 and 50 lb Tin Pails, ½c. ₱ lb over keg price; 12½ lb Tin Pails, 1c ₱ lb over keg price; assorted, 1 to 5 lb., 100 lb Cases, 12c.
Dry White Lead..less than 500 lbs..8¼c; over 500 lbs.8¼c
Orange Mineral, genuine, in kegs, 11c; in barrels, 10 c
Red Lead, very brilliant, " " 7½c
Litharge (Potter's Lead) " 8c; " 7½c
Freights equalized with all points.
Terms: Note at sixty days, or if paid within 15 days from date of invoice, a discount of 1½ per cent. will be allowed, but not otherwise.

Window Glass.

Per Box of 50 Feet.—Discount 40&10 % on single strength, 50&10 % on double.

Single Strength.

Size.	AA.	A.	B.	C.
6 x 8 to 10 x 15	$8.25	$7.50	$7.00	$6.50
11 x 14 to 16 x 24	9.25	8.50	8.00	7.25
18 x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	8.50
26 x 28 to 24 x 36	13.00	11.50	9.75	9.00
26 x 36 to 26 x 44	14.50	13.25	10.75	9.50
26 x 46 to 30 x 50	15.00	14.00	11.25	10.50
30 x 52 to 30 x 54	16.00	14 50	12.00	
30 x 56 to 34 x 56	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	

Double Strength.

6 x 8 to 10 x 15	12.75	11.75	10.75	10.00
11 x 14 to 16 x 24	14.50	13.25	12.50	11.25
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

BEECHER & PECK,

Successors to Milo Peck, Manufacturers of

PECKS DROP PRESS

11 Regular Sizes. Hammers from 50 lbs. to 2500 lbs.

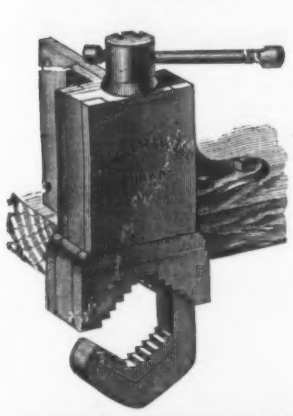
WE HAVE A LARGE STOCK OF SPECIAL DROP PATTERNS.

Special attention given to the making of all Drop Dies.

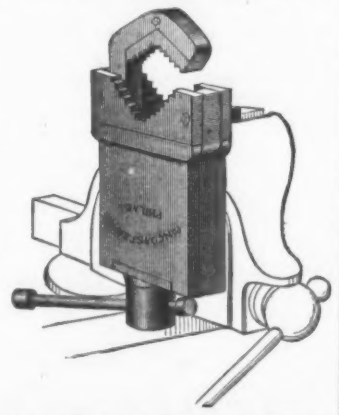
Special Machinery fitted up to order.

Send for Price List. New Haven, Conn.

IMPROVED PIPE-FITTERS' VISE.



STRONG,
LIGHT,
EFFICIENT,
CHEAP.



To meet the requirements of the large number of persons who have use for such an article, we invite attention to our Improved Pipe Vise. This Vise can be used either as a permanent fixture to work-bench, attached to angle plate or can (unlike others) be held between the jaws of any Machinist's or Blacksmith's Vise; the movable jaw being OPEN ON SIDE permits work to be gripped at any desired point without slipping it in from end, and allows of FITTINGS BEING HELD securely; the Box is made of Malleable Iron, the Screw of Wrought Iron, and the remainder of Solid Steel throughout. The Steel Gripping Jaws can be duplicated and replaced at any time when worn out. It is a very convenient tool, well adapted to the wants of Plumbers, Pump Fitters, Well-Drivers, and all who have use for a tool that is *strong, light, efficient and cheap* which can be readily carried about with kit of tools.

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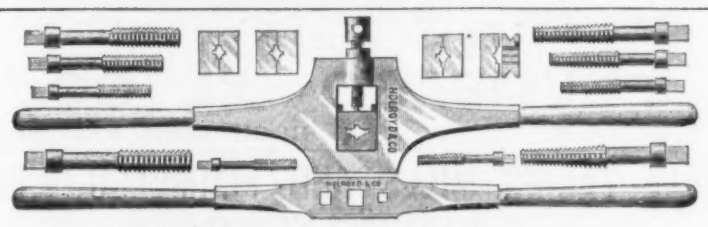

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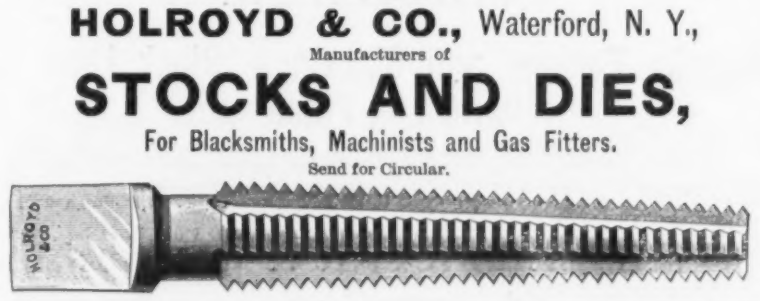

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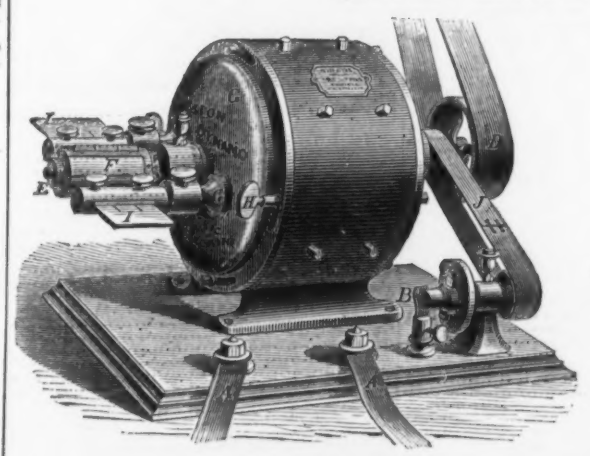

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By actual tests this machine has been found to yield more than double the amount of light per horse-power obtained from the best machines built in this country.

Please send full particulars regarding buildings or localities to be lighted, available power, &c.

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Hebe LAWN MOWERS,

Manufactured by

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These Machines stand unrivaled, having many points of novelty which are superior to all other Lawn Mowers. The cutting is done by a series of spiral knives operating against the ledger blade. They are so constructed that they will allow the tall grass to pass in between them and approach the ledger blade, as the machine moves forward, while the wipers reach around the grass and bring it against the knife, which cuts it off, thereby preventing the machine from clogging and cutting the grass more than once.

POINTS OF SUPERIORITY.

They will cut grass of any hight.
They run the easiest.
They are the easiest to sharpen.
They have the latest improved noiseless ratchet.
They will cut the grass the smoothest.
Every part, where found necessary, is made of malleable iron and steel.
Width of cut, 15 inches.
Every part is interchangeable.

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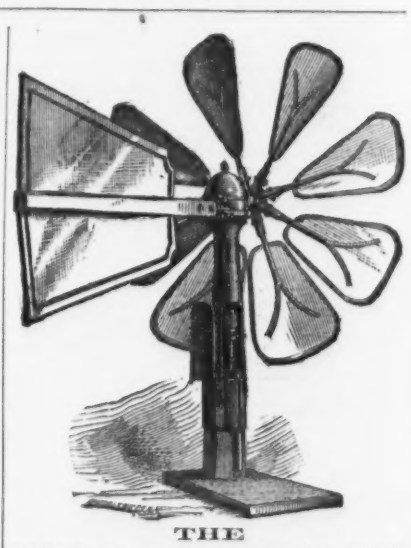

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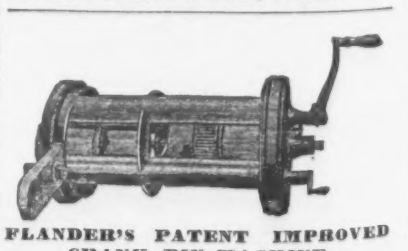

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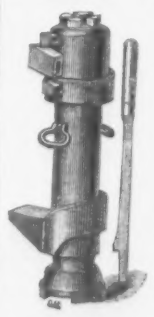

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For special and general use.

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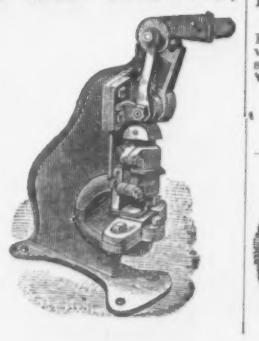

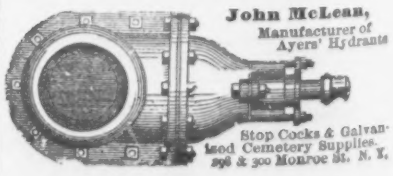

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Anvils.—"Eagle American".....₩ ℔ 9½c. dis 20 %
Apple Parers.—Reading Turn Table.....₩ doz $4.00
Goodell Turn Table..... " 5.40
" Improved Turn Table & Push-off " 7.50
" Lightning..... " 6.60
Hudson's Turn Table and Push-off..... " 6.50
Axes.—Blue Jackets..... per doz 11.00
Red Cross..... per doz 10.00
" Handled..... per doz 11.00
Dowse " Boys'.....dis 30 %
Ax Handles.—
Oak Extra, 31 in., No. A.....₩ doz $2.25
" 34 in., No. A.....₩ doz 2.50
" 31 in., No. B.....₩ doz 1.75
" 34 in., No. B.....₩ doz 2.00
" 31 or 34 in., No. C.....₩ doz 1.25
Axle Clips.....dis 50 %
Balances.—Chatillon's.....dis 15&10 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers)....per ft. 4c
" Half-Round.....per ft, ⅝, 6½c; ¾, 8c
Wrought " .....per ft, ⅝, 6c; ¾, 7c; ⅞, 8½c
Bells.—Connel's Crank Going.....dis 30&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1879.....dis 33⅓ %
Brass " " 1879.....dis 25 %
Blind Fasts.—Lock Fasts.....₩ C sets $6.00
No. 6 Fasts.....₩ C sets 6.50
Veazie Fasts.....₩ C sets 6.50
Shedd's.....₩ C sets 7.00
Blind Hinges.—Mall, Hook, 3 holes....₩ C sets 8.50
Brad Awl Handles.—
Phœnix Adjustable.....₩ doz $2.00
Bolts.—Norway Iron Carriage.....dis 50 & 10 %
Common " .....dis 50 %
Borax.—Refined.....₩ ℔ 12½c
Boring Machines.—Eagle Upright.....each, $3.75
Eagle Angle.....each, 4.60
Snell Augers.....₩ set 2.70
Braces.—Barber's.....dis 40 %
Spofford's.....dis 50 %
Backus'.....dis 50 & 10 %
Bracket Saws.—Holly Scroll Saw.....each $2.50
Demas Lathe and Scroll Saw..... " 6.50
Bracket Saws, extra quality, to No. 6.....₩ gro $0.75
Steel Frame, with patterns.....₩ doz 6.50
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %
Bracket Saw Blades.
Griffith's patent.....₩ gross 75c
Brackets.—M. H. & B. Flower Pot.....dis 35&10 %
Bronzed Shelf, M. H. & B. new list.....dis 40 %
Store Shelf.....dis 50 %
Bronze Hardware.—.....dis 30%
Butts.—Union Fast Joint.....dis 10&10 %
" Loose " .....dis 25&10 %
" Japanned Acorn.....dis 30&10 %
" Silvered " .....dis 30&10 %
" Boston Finish.....dis 60&10 %
Union Spiral Spring.....dis 25 %
Wrought Brass.....dis 30 %
Carriage Bolts.—Eagle Norway.....dis 50&10 %
Common.....dis 60 %
Carriage Jacks.
"Climax," No. 1.....₩ doz $18.00
" No. 1½....." 13.00
" No. 2....." 12.00
"Universal".....dis 25 %
" No. 1.....each, $2.00
" No. 2....." 3.00
" No. 3....." 6.00
" No. 4....." 6.00
" No. 5....." 6.50
Cartridges.—U. S. Cartridge Co.....dis 50&10 %
Cards.—Watson's makeHorse and Curry..dis 10%
" Cotton.....dis 10 %
" Wool.....dis 10 %
Casters.—Bed and Table.....dis 15&10 %
Chain.—Traces 6½, 10, 4, streight.....₩ pair 50c
" 6½, 10, 4, twisted.....₩ pair 60c
" 7, 12, 2, " .....₩ pair 85c
Coil 2-16.....₩ ℔ 13 c
" ¼.....₩ ℔ 9½c
" 5-16.....₩ ℔ 9 c
" ⅜.....₩ ℔ 8½c
" 7-16.....₩ ℔ 7½c
" ½.....₩ ℔ 7½c
Chalk.—White, Carpenter's.....₩ gross 50c
Red, Carpenter's.....₩ gross 80c
Blue.....₩ gross $1.00
Chisels.—Hart, Bliven & Mead, Framing.....dis 55 %
Underhill, Framing.....dis 20 %
Buck's Shank, Framing.....dis 30 %
Clothes Line.—
Galvanized Wire, 100 feet each.....₩ doz $4.50
Coal Hods.—"Dover."—Galvanized, new list..dis 40 %
Japanned, new list.....dis 40 %
Coffee Mills.—New list.....dis 35 %
Copper Rivets......dis 25 %
Cocks.—Brass, L. F. & C.....dis 25 %
Cordage.—Manila, usual trade dis 1c.....₩ ℔ 14½c
Jute.....₩ ℔ 11c
Cow Ties......dis 25 %
No. 30, 3 ft. No. 6 Wire, with toggle.....₩ doz $3.00
No. 35, 3 ft. " " with snap.....₩ doz 3.80
No. 40, 3½ ft, " " with toggle.....₩ doz 3.90
No. 45, 3½ ft. " " with snap.....₩ doz 4.10
No. 50, 4 ft. No. 4 " with toggle.....₩ doz 4.50
No. 55, 4 ft. " " with snap.....₩ doz 4.75
No. 60, 4½ ft. " 3 " with toggle.....₩ doz 5.50
No. 65, 4½ ft, " " with snap.....₩ doz

Crow-Bars.—Cast Steel.....₩ ℔ 8c
Iron Steel Pointed.....₩ ℔ 6c
Cutlery.—Pocket, American Shear Co.'s.....dis 40 %
Butcher Knives, "Woods," Lap Bolster, Square Handle.....dis 20 %
Steak Knives.....dis 15 %
Lap Bolster, Oval Handle.....dis 10 %
Sticking.....dis 20 %
Skinning.....dis 20 %
Butcher, Common Round Handle, "Woods".....dis 15 %
Shoe Knives, "Woods".....net list
Dividers.—Cook's.....dis 25 %
Dog Collars.....dis 20 %
Dog Muzzles.—Automatic.....dis 15 %
Door Springs.—Torrey's Rod.....₩ doz $3.00
Imitation Torrey's Rod.....₩ doz $2.25
Gem Coil.....net list
Crown.....₩ doz $1.50
Warners.....₩ doz $1.35
Door Stops.—"Thurston's".....dis 45 %
Drawer Knobs.—"Thurston's".....dis 45 %
Drills.—Morse Bitt Stock.....dis 25 %
Morse Straight Shank.....dis 20 %
Emery.—Wellington Mills.....₩ ℔ 10c
The Alden Emery Co.....₩ ℔ 6c
Turkish in 10 ℔ cans.....₩ ℔ 8c
Enameled Ware.
Standard Mfg. Co. Kettles.....dis 40 %
" Sauce Pans.....dis 25 %
Felloe Plates.—Wrought.....₩ ℔ 9c
Files.
American File Co.....dis 25 %
Nicholson " .....dis 20 %
Fluting Machines.
Knox list, $1.00.....dis 10 %
American list, $3.40.....dis 10 %
Forks. W. C. & Co., Manure.....dis 40 %
Gimlet Bitts.
Genuine German, No. 125, 1-32 to 8-32, per doz $1.00
Pierce's.....per doz 35c
Glass Cutters.
Combination Class Cutter and Knife Sharpener.....₩ doz $1.00
Grub Hoes.—K. P. & Co.'s No. 2, 11.50 ₩ doz.dis 15 %
Hammers.—Maydole's.....dis 15 %
Hammond's.....(new list.).....dis 20 %
Hangers & Rollers.—Anti-Friction.....dis 50&10 %
Acme Rollers.....dis 40 %
Climax.....dis 40 %
Common Hangers.....dis 5&10 %
" Rollers.....dis 15&10 %
Hand Screws......dis 10 %
Hatchets.—C. F. Dowse new list.....dis 30 %
Underhill.....dis 20 %
Hay Knives.—Lightning.....₩ doz $18.00 net
Fisher's Patent.....₩ doz @14.00
Hinges.—Strap and T (new list).....dis 20&10 %
Providence Plate.....₩ ℔ 6½c
Wrought Screw Hook.....₩ ℔ 6½c
Hoes.—W. C. & Co.'s.....dis 40 %
Hooks and Staples.—Brewers'.....dis 40 %
Horse Nails. No. 6 7 8 9
National Finished..... .23 .21 .20 .19....dis 20 %
Putnam Pointed..... .26 .24 .23 .22.....10 %
Horse Nails.—Bridgewater.....dis 25 %
No. 6 2c; No. 7, 2c, No. 8, 2c; No. 9, 1c.
Ice Cream Freezers.—"Packer's".....dis 33⅓ %
Knobs.—"Norwalk." New list.....dis 50 %
Silver Glass.....dis 50&10 %
" Bell Pulls.....dis 60&10 %
Lanterns.—Tubulars, No. 0.....₩ doz 9.00
Railroad, Oil, No. 43.....₩ doz 5.00
Triangular.....₩ doz 4.00
Hurricane.....dis 20 %
Lead.—Sheet.....₩ ℔ 9 c
Pipe.....₩ ℔ 8½c
Locks.—Norwalk Genuine Bronze Goods.....dis 30 %
Eagle Cabinet.....dis 10 %
" Trunk.....list net
W. Wilcox & Co., Padlocks.....dis 10&5 %
American Lock Co.'s Steel Key.....dis 33⅓ %
Metallic Sieves.—Mann's Patent.....dis 25 %
Manure Forks.—W. C. & Co.....dis 40 %
Mattocks.—K. P. & Co., Long Cutter, 18.00 ₩ doz.
.....dis 15 %
K. P. & Co., Short Cutter, 15.50 ₩ doz.....dis 15 %
" " Pick " 16.00 ₩ doz.....dis 5 %
Measuring Tapes.—Eddy's.....dis 10 %
Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's, (New list).....dis 40 %
American.....dis 25 %
Money Drawers.—Tucker's Alarm.....₩ doz $22.50
Mouse Traps.—Delusion.....₩ doz 3.00
Novelty.....₩ doz 1.75
Nails......₩ keg, rates 5.00
Oilers.—Zinc and Tin.....dis 45 %
Brass and Copper.....dis 25 %
Ox Bows.—Extra finished and varnished.....list net
1¼ in., ₩ doz. pair, $5.75 | 2 in., ₩ doz. pair.....$9.00
1¾ in., " " 7.00 | 2¼ " " 11.00
Padlocks.—W. Wilcox & Co.'s.....dis 10&5 %
Miller's Brass.....₩ doz $7.50
Paper.—Tarred Sheathing.....₩ ℔ 2½c
Dry Sheathing.....₩ ℔ 2½c
Picks.—E. P. & Co., Adze Eye, 5 to 6 ℔.....dis 15 %
" " 6 to 7 ℔.....dis 15 %
Planes.—Greenfield Tool Co.....dis 25 %
N. Y. Tool Co.....dis 25 %
English Iron.....dis 50 %
Bailey's.....dis 20 %
Plated Ware.—Rogers & Bro.....dis 33⅓&5 %
Pliers.—Vom Cleff & Co.'s.....net list
Button's Wire Pliers.....dis 33⅓ %
Plumb & Levels.—Stanley, R. & L. Co..dis 60&10 %
Pocket Knives.
American Shear Co.'s.....dis 33⅓&10 %
Potato Diggers.—W. C. & Co. reduced list...dis 40 %
Pulleys
Acme or Excelsior, 1¾ in.....per doz 33c
" " 2 in....." 38c
Pulley Blocks.....dis 40%
Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 35 %
" Pitcher Spout.....dis 35 %
Copper.....dis 30 %
Rivets.—Black.....dis 30 %
Carriage in 20 ℔ papers.....dis 10 %
Copper.....dis 25%
Razor Strops.—Torrey's.....Full line
Rules.—Stanley.....Boxwood, dis 45&10 %
" Ivory, dis 45&10 %
Sadirons.—Common.....₩ ℔ 4½c
Laundry.....₩ ℔ 6c
Tailor's Geese.....₩ ℔ 6c
Enterprise, "Potts".....dis 20 %
Sash Locks.—King & Hutchinson's, new list.dis 40 %
Hopkins & Dickinson's.....dis 40%
Sandpaper.—Baeder & Adamson.....dis 25&5 %
M. B. & D.....dis 25&5 %
Sash Weights.—Patent Eye.....₩ ℔ 2½c
Saws.—Hand Saws, Disston's.....dis 20 %
Wheeler & Clemson.....dis 20 %
Cross-Cut Saws.
W. M. & C., Common Tooth, No. 1.....₩ foot 40c
" " Champion " .....₩ foot 40c
Disston's, Common " .....₩ foot 44c
" " Gt. American " .....₩ foot 44c
Boynton's Lightning " .....₩ foot 50c
M. B. & D., Hand Saws.....dis 25 %
W. M. & Co.'s Circular Saws.....dis 35 %
Richardson Bros.....dis 25 %
Saw Setts.—Spring Lever.....₩ doz $10.00
Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 12½ %
Welch & Griffith, Extra.....₩ doz $8.40
" " No. 2.....₩ doz 7.00
Scales.—Fairbanks.....dis 20 %
Screws.—Aiken's Flat-Head Iron.....dis 40 %
American Flat-Head Iron.....dis 40 %
" " Brass.....dis 30 %
" Round-Head " .....dis 15 %
" " Iron " .....dis 30 %
Grilley " Nickel-plated Common.dis 50 %
Scythes.—Clippers, in boxes.....₩ doz $9.00
Shaves.—Kimball's.....₩ inch, $1.00
Watrous.....dis 15 %
Shears.—American Shear Co., new list.....dis 70 %
Shot.—Tatham's.....₩ ℔ 9c
Shovels.—O. Ames, new list.....dis 10 %
O. Ames, other brands, new list.....dis 10 %
M. B. & D.....dis 10 %
Oxford Birmingham Pattern.....dis 45 %
Sinks.—Magee Patent.....dis 25 %
Snow Shovels.—Malleable tips.....₩ doz $4.00
Skates.—Union.....dis 25 %
Acme.....dis 25 %
Stock and Dies.—King's.....dis 10&5 %
Tacks.—A. Field & Son's.....dis 20&10 %
Pittsfield.....dis 20&10 %
Swedes Tinned.....35&10 %
Swedes Iron.....20&10 %
Gimp and Lace.....20&10 %
Copper Tacks.....20&10 %
All balances on list.....25&10 %
Traps.—Oneida, Genuine.....20&10 %
Oneida, Imitation, H. & N.....dis 33⅓ %
Blake's.....dis 50 %
.....dis 40 & 5 %
Tree Scrapers.—No. 1.....₩ doz. $2.50
No. 2.....₩ doz 3.00
No. 3.....₩ doz 4.00
Vises.—Simpson's Adjustable.....dis 25 %
Howard Vise Co.....dis 20 %
Prentiss'.....dis 20 %
Weather Strips.—Packer's.....₩ doz $4.00
Browne's Flexible Rubber.....dis 30 %
In 20 feet Boxes; No. 1, ⅛ in. wide, ₩ yard, 20c.; No. 2, ¼ in., 15c. No. 3, ¾ in., 20c.; No. 4, 1 in., 25c
Black Walnut Spring Weather Strips.....₩ doz. $3.00
Window Springs.
Babcock's No. 3.....dis 20 %
" " 4.....₩ gross $6.00
Wire Cloth.—"Clinton".....₩ ft. 4 c
Wire Goods.—Gate Hooks and Eyes, &c., new list.....dis 50&10 %
Wrenches.—A. G. Coe's.....dis 25&5 %
Girard Mfg. Co.....dis 25&10 %
Girard Agt.....dis 40 %
Wringers.—Universal, No. 2.....₩ doz $6.50
Universal, No. 3.....₩ doz 8.00
Novelty, No. 10.....₩ doz 6.00
" No. 2.....₩ doz 6.00
" No. 22.....₩ doz 7.00
Excelsior, No. A.....₩ doz 7.00
" No. B.....₩ doz 8.00
" No. CC.....₩ doz 10.00
Novelty Set Tub, E.....₩ doz 9.00
Eureka.....₩ doz 7.00
Keystone, Wood Frame No. 1½.....₩ doz 5.00
" Iron Frame No. 3½.....₩ doz 6.00
Zinc......₩ ℔ 7½c
Withington, Cooley & Co.—Hoes, Rakes, Forks, &c. Special rate for Export.

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It is a common method to advertise Governors *without cost,* unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judso " are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying o her Governors should stipulate that their durability be guarante d, and should also take care that they do not, for much inferior Governors, pay higher prices than to use shown in the accompanying li t. We guarantee the Judson Governor will do all any other Governor can do, and in accuracy and durability—the main essentials—we guarantee it shall do more.

Reduced Price List.

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☞ For dimensions of Governor, see Illustrated Price List.

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Size, Inch.	Plain.	Bright Finished.	Extra for Spe'd'r	Stop Valve.
½	$15.00	$17.00	$1.90	....
¾	16.00	18.00	1.90	....
1	18.00	20.00	2.00	....
1¼	20.00	23.00	2.25	..
1½	23.00	27.00	2.50	$6.00
2	27.00	31.00	2.75	7.50
2¼	32.00	37.00	3.25	9.00
2½	36.00	41.00	3.50	11.00
2¾	40.00	46.00	3.75	12.00
3	45.00	52.00	4.25	14.00
3½	54.00	62.00	4.50	17.00
4	64.00	73.00	5.00	21.00
4½	74.00	84.00	5.50	25.00
5	84.00	95.00	6.00	31.00
5½	97.00	109.00	6.50	37.00
6	112.00	125.00	7.00	42.00
7	132.00	146.00	8.00	50.00
8	160.00	176.00	9.00	60.00
9	180.00	198.00	10.00	75.00
10	200.00	220.00	12.00	....

No Charge for Boxing or Cartage.

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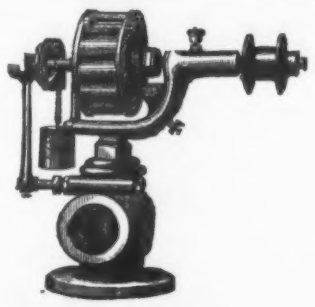
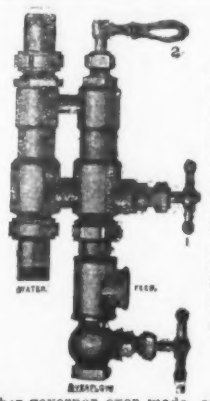


The Allen Governor



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Eclipses all other appliances hitherto introduced for feeding Steam Boilers. A Portable Boiler is not per feet without one. It lifts its water 25 feet with a low steam pressure, and puts it directly into the Boiler. No adjustment necessary for varying steam pressures.

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Warranted to govern all engines in use better than any other governor ever made, and is the only governor in the world that will thoroughly control and regulate all kinds of link motion and variable cut-off engines, including the Corliss (to which it is specially adapted) and all other engines subject to great variations. Every engine to which it is attached will run with the throttle wide open. And to whatever changes in steam pressure, or changes, however sudden, in power used, the engine may be subjected, it should not vary more than one revolution as long as there is sufficient steam to do the work.

This governor is simple in construction, not liable to get out of order, permits the speed of the engine to be changed at will, is neat in appearance, noiseless, very durable, saves the engineer's time, saves fuel, and is at once the most powerful and most sensitive governor ever made.

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COVERING ALL LOSS OR DAMAGE TO

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STEAM BOILER EXPLOSIONS.

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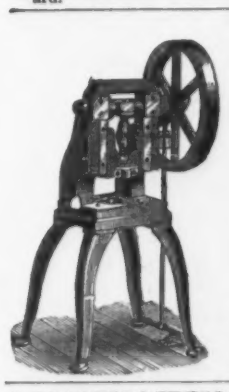

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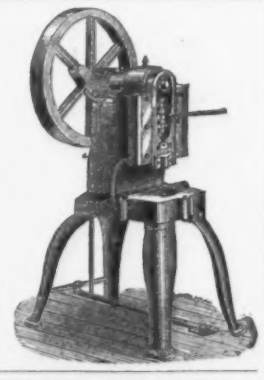

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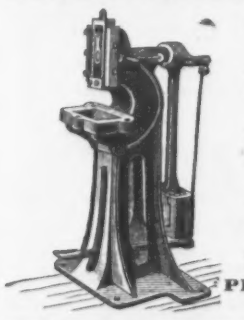
Judges' Report.—"He exhibits a power press, or punch, which is a well-made, substantial machine, and contains several features of marked originality, which materially augment its durability and efficiency."

ASTONISHING POWER in PUNCHING PRESSES.



Punching, by foot, *3-4* hole in *5-16* iron 6 inches from edge.

Smaller sizes punch, by foot, *3-8* x *1-4*, and *1* inch by *1-8*, as rapidly as by power presses, at one-half the cost.

Our largest hand machines punch *1* inch hole in *3-8* iron, and shear bar *3-4* x *2* inches at a cut, any length, one man at the lever.

Highest prize, *The Grand Medal of Progress*, has just been awarded us at the American Institute Exhibition.

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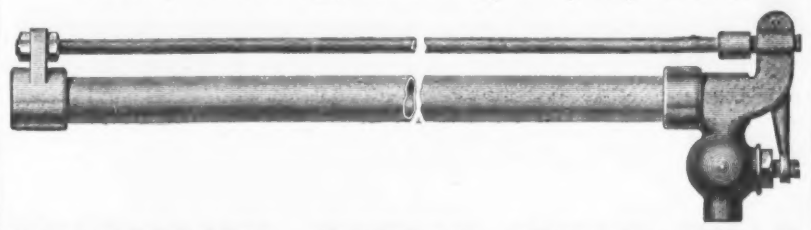

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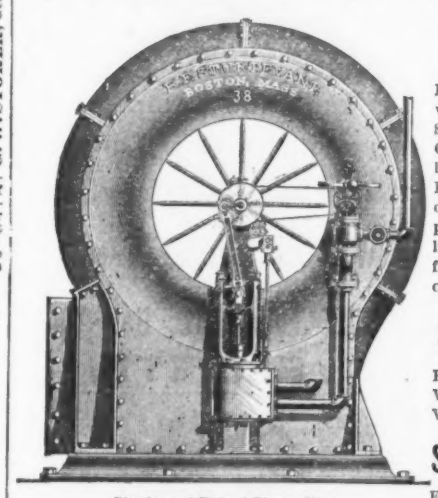

Sturtevant Patent Steam Fan.

Sturtevant's Patent Steam Fan,

For Blowing Furnaces of all kinds, such as are provided with grate bars; especially adapted for Steam Boilers, Puddling and Heating Furnaces. Coal Screenings and all kinds of refuse coal may be successfully used for fuel by the use of these Fans to create blast. For forcing fresh air into, or taking foul air out from Coal Mines and other places needing ventilation, such as Hospitals, Asylums, Theaters and other Public Buildings, Manufacturing Establishments, &c. Also for numerous other uses where large volume of air is required.

Sturtevant Patent Exhaust Fan,

For removing Shavings and Dust from Wood-Working Machines, Dust from Sand and Emery Wheels, and for Ventilation.

Sturtevant Steel Pressure Blower,

For Cupola Furnaces and Forges. The Blower, which excels all others, produces *maximum* results with *minimum* power. Used in the largest establishments in the country, where the strongest blast is required.

Sturtevant Patent Improved Fan Blower,

For Steam Boilers, Puddling and Heating Furnaces.

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AND GENERAL MACHINERY AND SUPPLIES

For Railways, Steamships, Mills, Mines and Manufacturers,

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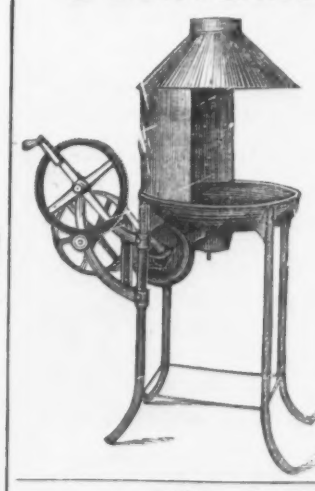

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Steam Boiler Tube Cleaner

I will send one on trial, to responsible parties,

Guaranteeing it to give entire satisfaction or no sale.

They have been pronounced by all who have used them the most

EFFICIENT,

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Machines ever offered for this purpose.

Descriptive circular on application.

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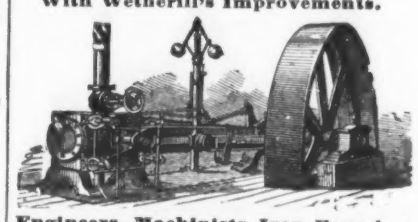
Independent 4-Jawed Chucks, from 6 in. to 24 in. in diameter. Common Lever Scroll Chucks, from 3 in. to 24 in. Patent Geared Chucks, from 3 in. to 12 in. Common Geared, from 2 in. to 12 in. A large variety of Chucks for Amateurs' Foot Lathes. Drill Chucks for all kinds of machines and purposes. Patent Geared Chucks for Hollow Spindle Cutting-off Machines. Bench and portable Centering Chucks, and special chucks made to order. Satisfaction guaranteed. All of the above are from new patterns, with every improvement a long experience can suggest. Send for price list.

Machinery, &c.

Corliss Engine Builders.

With Wetherill's Improvements.



Engineers, Machinists, Iron Founders and Boiler Makers.

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Box's Patent Portable Double Screw Hoist.

With New Patent Self-Adjusting Chain Guide.

FIRST PREMIUM WHEREVER EXHIBITED.

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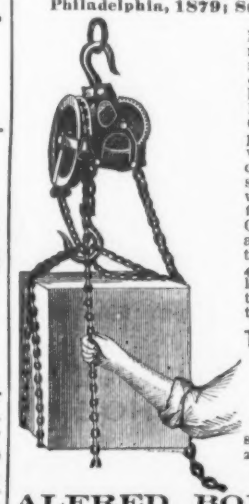

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The Perfection of Holsting Machines.

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Also, Box's Patent Radial Drills, full line of Machinists' Tools, Drills, Engines, Shafting, Hangers, Pulleys, Hoists, Elevators, &c.

Established 1867.

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LATHES,

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BORING MILLS,

Radial, Upright, Suspension Multiple, Lever, Carriage Makers' Blacksmiths' Hand and Power Post

DRILLS,

and a variety of other MACHINISTS' TOOLS

Patent

Double Chain Screw Pulley Blocks,

unrivalled for *Durability, Safety* and *Power.*

Patent Double Chain Quick-Lift Hoists,

with Brake for quick and easy lowering.

Circulars furnished.

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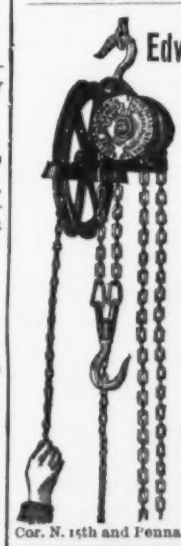

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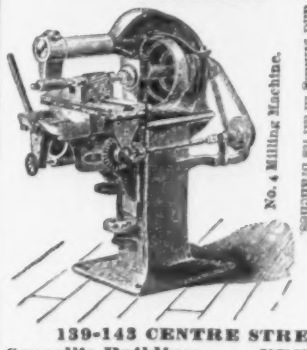

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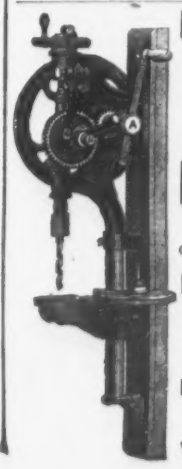

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